U.S. Department of the Interior

Bureau of Land Management

Cape Geothermal Power Project

Beaver County, Utah

Environmental Assessment

October 2024

DOI-BLM-UT-C010-2024-0018-EA

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CHAPTER 1.0. INTRODUCTION

The introduction of the proposed project is to give background and a brief overview of the proposed project, including the BLM's purpose and need for the project.

Throughout the Environmental Assessment (EA), as a result of the public comment period on the draft EA, any red text is a new addition to the EA document. This is done as a result of the comment period or changes that were needed that have been identified internally to make the document more complete. Any ~~strikethrough~~ text is text that has been removed from the draft to final version of the EA document. This is done to identify changes more easily to final version of the EA document for the reader.

1.1. SUMMARY OF PROPOSED PROJECT

FEC E&P Management LLC and Escalante Desert Resources LLC (EDR), together known as EDR, have obtained the rights, via geothermal lease agreements, to explore for and develop renewable geothermal resources on private lands, lands owned by Utah's Trust Lands Administration (TLA), and on federal public lands managed by the Bureau of Land Management (BLM).

The BLM previously completed an Environmental Assessment (EA) (DOI-BLM-UT-C010-2023-0004-EA) analyzing the potential impacts associated with the proposed Cape Modern Geothermal Exploration Project. The BLM issued the Finding of No Significant Impact (FONSI) and Decision Record for the Cape Modern Geothermal Exploration Project on February 13, 2023. The Cape Modern Geothermal Exploration Project identified a commercially viable geothermal resource.

EDR is proposing to construct, operate, and maintain the Cape Geothermal Power Project (project) in Beaver County, Utah (**Figure 1-1**), with the intent to bring the identified geothermal resource to market. The proposed project would include the conversion of some of the exploration wells into production and injection wells, the construction of additional production, injection, and observation wells, the construction of additional access roads and utility lines, and connection to modular geothermal power plants. Proposed activities include the development of an estimated 320 geothermal production and injection wells, up to 20 modular geothermal power plants, a power distribution system, an electrical switchyard, a general tie-in transmission line, geothermal fluid pipeline gathering system, associated access roads, and ancillary facilities such as pumping stations and required tie-in upgrades. Temporary laydown yards around the power plant construction sites would be utilized for offloading of materials and preinstallation equipment storage. The power plants, electrical switchyard, and associated laydown yards would all be located on private land near the proposed well pad locations. The proposed Cape Geothermal Power Project Plan of Operations (POO) including facility design and pad construction details are outlined in the attached POO (**Appendix A**) and in Section 2.2. EDR will also request a right-of-way (ROW) grant for the construction and maintenance of off-lease well pads, access roads, and power transmission corridors associated with the proposed project. Relocations on BLM administered lands within the AOI would receive the appropriate inventory and consultation to avoid impacts to biological or cultural resources and would be subject to BLM sundry notice and approval.

The Area of Interest (AOI) for the proposed project consists of approximately 34,813 acres of federal, TLA, and private geothermal surface located north-northeast of Milford in Beaver County, Utah (**Figure 1-2**). The AOI includes existing geothermal leaseholds, areas with pending geothermal leases, and areas that are unleased but may be leased in the future. The BLM administered lands are managed by the BLM Cedar City Field Office. To facilitate development, the AOI will largely be encompassed by an Exploration Unit Agreement. The unit was designated via letter signed by Christina Price, BLM Utah State Office Deputy

State Director of Lands and Minerals, on June 27, 2024. The proposed project is located adjacent to other existing geothermal, wind, and solar power facilities that have been successfully developed in the region.

The project area selected for the proposed project encompasses up to approximately 631 acres of BLM and private surface primarily located within existing geothermal leaseholds. The project area includes all proposed project components and associated surface disturbance. Surface disturbance within the AOI may be lower, with multiple wells installed per pad; however, this EA will assess the maximum surface disturbance potential of approximately 631 acres. Of the maximum surface disturbance, approximately 155 acres (~25% of the project footprint) are planned to be located on BLM surface. The development on BLM surface will include well pads, access roads, distribution lines, transmission lines, and pipelines. The remaining 476 acres (~75% of the project footprint within the larger AOI) are planned to be located on private surface. The development on private surface will include all power plants and the switchyard, as well as additional well pads, access roads, distribution lines, transmission lines, and pipelines.

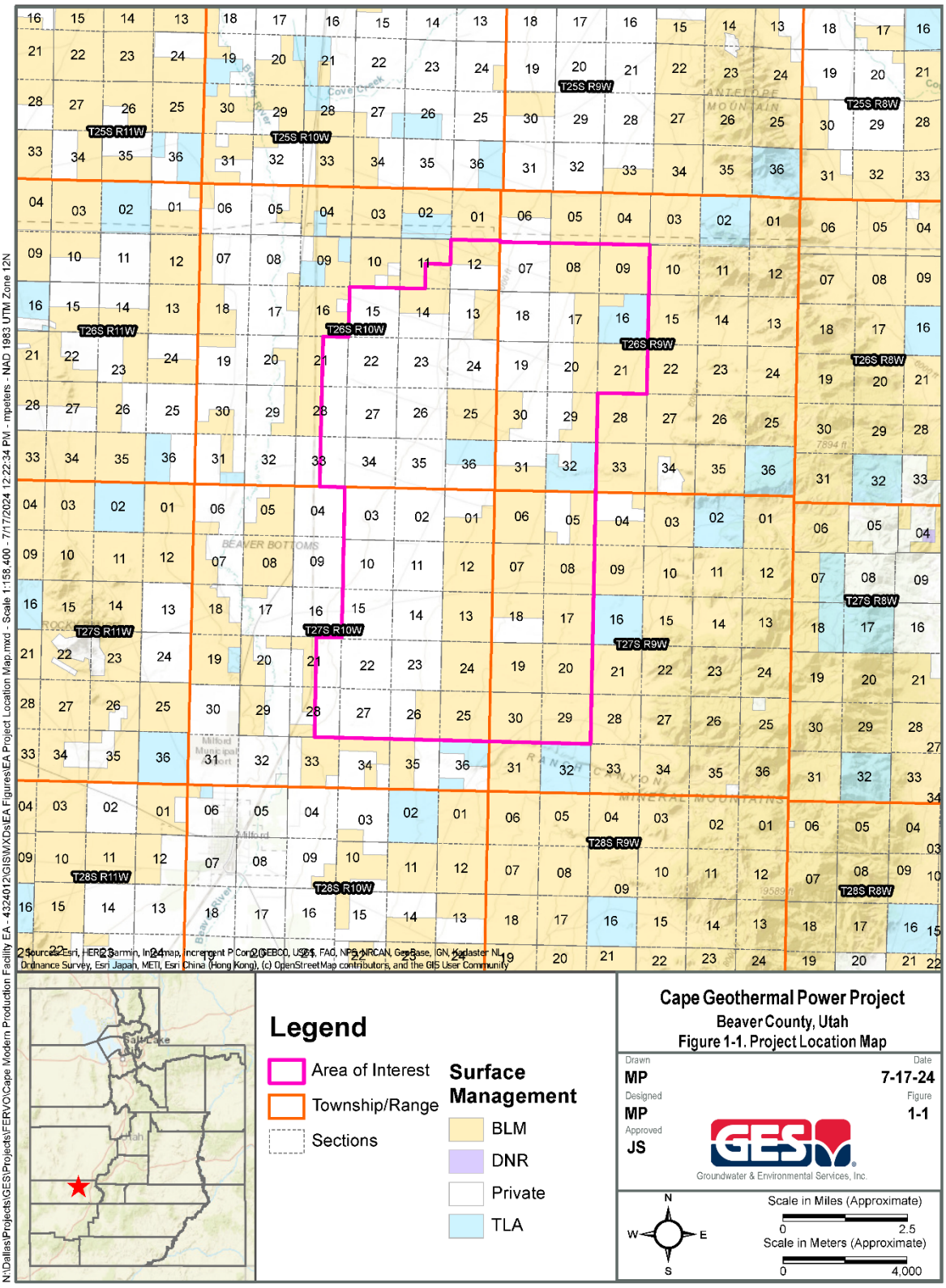

Figure 1-1. Project Location Map.

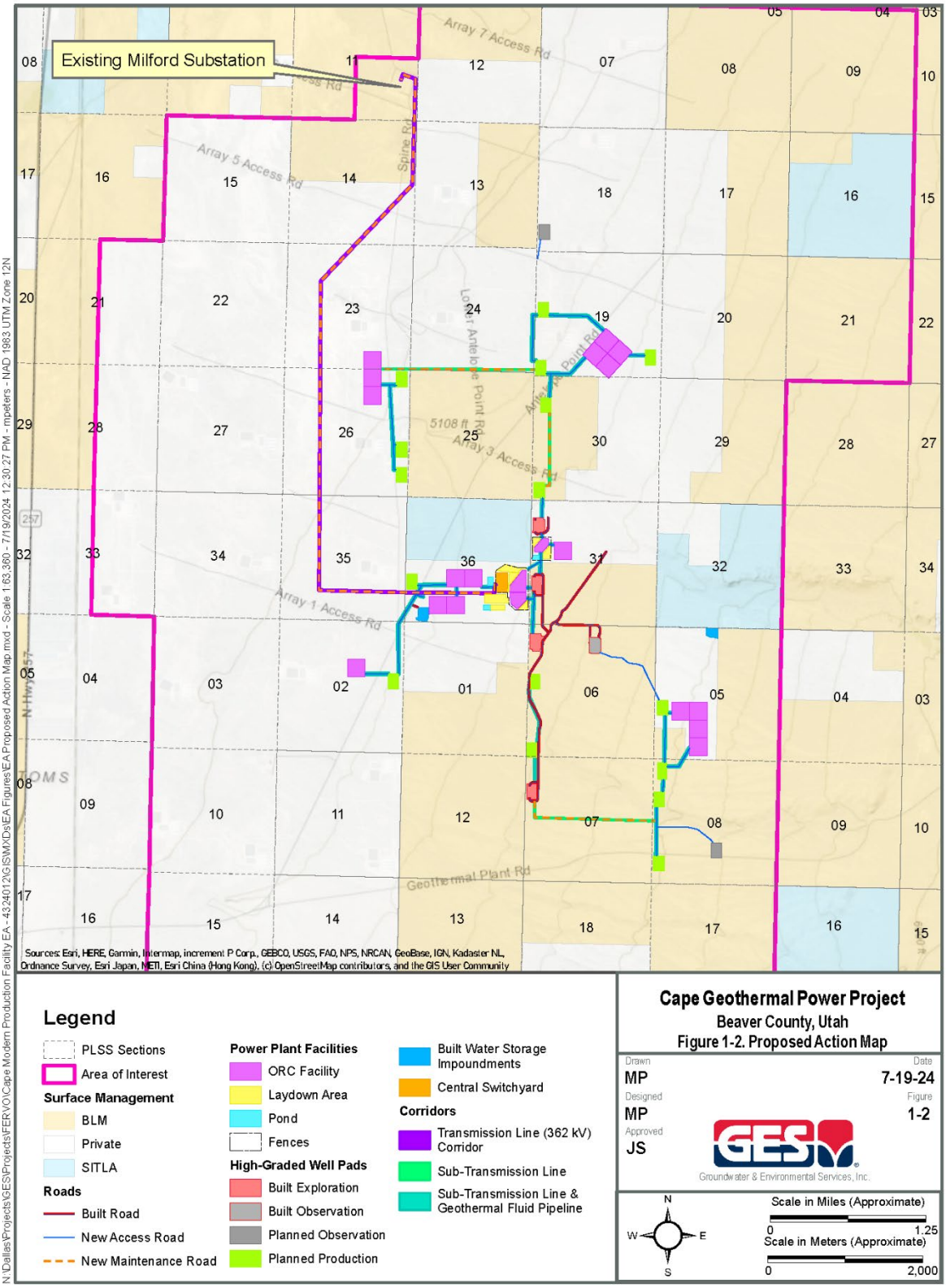

Figure 1-2. Proposed Action Map.

1.1.1. Background

EDR previously obtained the rights, via competitive geothermal lease sale, to explore for and develop renewable geothermal resources within federal geothermal leases UTU-95314, UTU-95315, and UTU-95318, which were included as sale parcels in the December 2020 Utah Geothermal Competitive Lease Sale (BLM Utah State Office 2021), and within federal geothermal leases UTU-105294998, UTU-105294999, and UTU-105295000, which were included as sale parcels in the 2022 Utah Geothermal Competitive Lease Sale (BLM Utah State Office 2022). The federal leases were approved for geothermal exploration and production activities by previous NEPA analyses including the Programmatic Environmental Impact Statement (EIS) for Geothermal Leasing in the Western United States (BLM and USFS 2008), the BLM Determination of NEPA Adequacy (DNA) for the December 2020 Utah Geothermal Competitive Lease Sale (DOI-BLM-UT-0000-2019-0006-DNA) for the exploration and development of geothermal resources within 28 parcels in Iron, Millard, and Beaver Counties, Utah (BLM Utah State Office 2021), and the BLM DNA for the 2022 Utah Geothermal Competitive Lease Sale for the exploration and development of geothermal resources within 11 parcels in Millard and Beaver Counties, Utah (BLM Utah State Office 2022).

The BLM completed an Environmental Assessment (EA) (DOI-BLM-UT-C010-2023-0004-EA) analyzing the potential impacts associated with the proposed Cape Modern Geothermal Exploration Project, which included federal geothermal leases UTU-95314 and UTU-95318 as well as two split-estate private geothermal leases. Geothermal exploration work under the Exploration EA began in June 2023, resulting in the construction of well pads, water storage impoundments, and access roads.

The AOI for the proposed action consists of approximately 13,981 acres of federal geothermal leases and approximately 15,039 acres of private geothermal leases (**Appendix B** and **Figure 1-3**). Some areas within the AOI (approximately 5,793 acres) have geothermal leases that are currently pending or are un-leased by EDR. These areas are not reflected in **Appendix B**, and no surface or underground development would take place in these areas until and unless leases for these areas are secured. The project area selected for the Cape Geothermal Power Project encompasses approximately 631 acres of BLM and private surface primarily located within the existing geothermal leaseholds. All geothermal wells proposed as part of the project would be located within federal geothermal leases on public lands managed by the BLM or privately held geothermal leases on private land, though wells may be relocated to other federal, state, and private property within the AOI as new leasing arrangements are finalized and as the geothermal resource continues to be explored.

The AOI is entirely encompassed within a Federal Geothermal Exploration Unit. The unit was designated via letter signed by Christina Price, BLM Utah State Office Deputy State Director of Lands and Minerals, on June 27, 2024. This Unit Agreement, as defined by 43 CFR Section 3280.2, is an agreement for the exploration, development, production, and utilization of multiple geothermal resource leases made subject to a single consolidated development unit that operates as a single lease across multiple separate ownerships. Unitization provides for the allocation of costs and benefits across the Unit. The Cape Geothermal Power Project Unit includes federal, state, and private property, and is located in Beaver and Millard Counties, in the State of Utah.

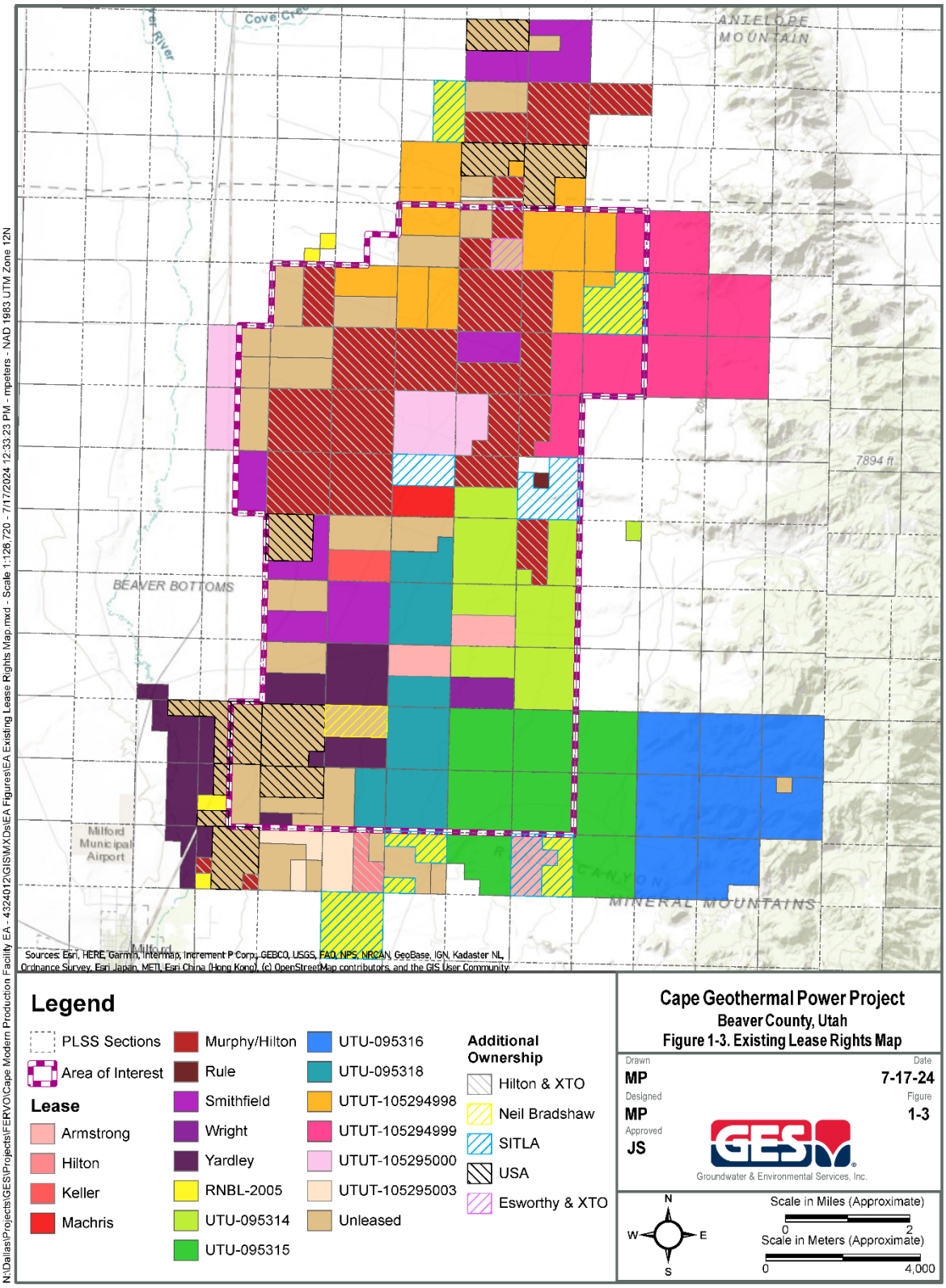

Figure 1-3. Existing Lease Rights Map.

1.2. PURPOSE AND NEED

The purpose of the federal action is to respond to EDR's proposal to exercise its valid federal geothermal leases (UTU-95314, UTU-95315, UTU-95318, UTU-105294998, UTU-105294999, and UTU-105295000) to construct, operate, and maintain the Cape Geothermal Power Project on BLM-administered lands in Beaver County, Utah. The proposed action includes the development of an estimated 320 geothermal production and injection wells, up to 20 modular geothermal power plants, a power distribution system, an electrical switchyard, a general tie-in transmission line, geothermal fluid pipeline gathering system, associated access roads, and ancillary facilities such as pumping stations and required tie-in upgrades, as outlined in the POO (see **Appendix A**). The power plants, electrical switchyard, and associated laydown yards would all be located on private land near the proposed well pad locations. The proposal also includes the application for a ROW grant(s) for off-lease well pads, access roads, and power transmission corridors associated with the proposed project.

The need is established by the BLM's statutory and regulatory responsibilities regarding operations on lands leased for geothermal resources under the Geothermal Steam Act of 1970 and associated regulations (43 Code of Federal Regulations [CFR] 3200), and in furtherance of the Energy Policy Act of 2005 (Title II Section 225). The need to respond to EDR's ROW application is established under the Federal Land Policy and Management Act of 1976 (43 CFR 2800).

1.3. DECISION TO BE MADE

The BLM will make the following decisions based on the analysis in this EA:

1. Whether to approve or deny the proposed Cape Geothermal Power Project, as outlined in EDR's POO (**Appendix A**), to develop an estimated 320 geothermal production and injection wells and construct ancillary facilities, if so, under what terms and conditions.

2. Whether to approve or deny the proposed ROW for the construction and maintenance of an approximately 2,400-ft portion of the proposed general tie-in transmission line and maintenance road crossing BLM lands off-lease, and if so, under what terms and conditions.

1.4. LAND USE PLAN CONFORMANCE

The Proposed Action is subject to the *Cedar Beaver Garfield Antimony (CBGA) Record of Decision/Resource Management Plan* (ROD/RMP) (BLM 1986), which contains the objectives and land use decisions for BLM-administered public lands within the Cedar Beaver Garfield Antimony Planning Area. The CBGA RMP includes the following applicable objectives:

- Minerals: "Provide maximum leasing opportunity for oil, gas, and geothermal exploration and development by utilizing the least restrictive leasing categories necessary to adequately protect sensitive resources" (page 19).

Under the Proposed Action, geothermal development opportunities would be increased. AUMs would not be permanently reduced; potential soil erosion would be mitigated through salvage of topsoil at pad locations, erosion control measures, and reclamation (Section 2.2.11 and **Appendix D**); potential surface water impacts would be mitigated through the implementation of a stormwater pollution prevention plan (SWPPP), interim and final reclamation, and appropriate permitting.

1.5. RELATIONSHIP TO STATUTES, REGULATIONS, OTHER NATIONAL ENVIRONMENTAL POLICY ACT DOCUMENTS

The Proposed Action is consistent with federal laws, state laws, local laws, and BLM policy. The Proposed Action is consistent with the following statutes, regulations, and other documents:

Table 1-1. Relationship to Statutes, Regulations, and Other Plans

Relevant Statute, Regulation, Policy, or Plan	Relationship to the Proposed Action	Conformance of the Proposed Action
Migratory Bird Treaty Act (MBTA) of 1918	The MBTA prohibits the take (killing, capturing, selling, trading, and/or transport) of migratory birds and their nests or eggs without a permit. The list of protected migratory birds includes raptors.	The Proposed Action would adhere to migratory bird design features, including nest surveys, to ensure no take of migratory bird species occurs (**Appendix D**).
Bald and Golden Eagle Protection Act of 1940	The Bald and Golden Eagle Protection Act prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald or golden eagles, including their parts, nests, or eggs.	The Proposed Action would adhere to migratory bird design features, including nest surveys, to ensure no take of Bald and Golden Eagles occurs (**Appendix D**).
National Historic Preservation Act (NHPA) of 1966, Section 106 54 U.S.C. § 100101, commonly referred to as Section 106 of the National Historic Preservation Act (NHPA), Executive Order (EO) 11593 - Protection and Enhancement of the Cultural Environment (1971), BLM National Programmatic Agreement for NHPA (2012)	Geothermal leasing is considered an undertaking pursuant to Section 106 of the NHPA. Agencies must take into account the effects of their undertakings on historic properties. Under EO 11593, the federal government shall provide leadership in preserving, restoring and maintaining the historic and cultural environment of the Nation. The BLM National Programmatic Agreement encourages BLM state directors and SHPOs to develop mutually agreed upon two-party BLM-SHPO protocols regulating how consultation will take place. The agreement also encourages BLM state directors to use phased identification and evaluation as described in 36 CFR 800.4(b)(2) (BLM 2012).	Section 106 of the National Historic Preservation Act (NHPA) will be implemented using a phased approach as outlined in 36CFR800.4(b)(2). Once individual project areas are identified, a cultural resource investigation will be conducted, and the BLM will consult with appropriate Native American tribes and the Utah State Historic Preservation Officer (SHPO). All phases of 106 cultural resource inventory will be completed prior each phase of project implementation. SHPO concurred with this phased identification approach on July 15, 2024. The BLM commits to having No Adverse Effects to Historic Properties (cultural resources eligible for or listed on the National Register of Historic Places).
National Environmental Policy Act (NEPA) of 1969	The National Environmental Policy Act (NEPA) of 1969 was enacted to assure that all branches of government give proper consideration to the environment prior to undertaking any major federal action that significantly affects the environment. Any proposed projects on BLM land would invoke NEPA requirements.	This EA has been prepared for compliance with NEPA.
Geothermal Steam Act of 1970, Clean Air Act (1970)	The Geothermal Steam Act governs the leasing of geothermal steam and related resources on public lands. Clean Air Act (CAA) permitting in the State of Utah is the responsibility of the Division of Air Quality of the Utah Department of Environmental Quality (UDAQ). Project activities would be required to adhere to all air quality standards set by the UDAQ.	The Proposed Action would meet the BLM's statutory and regulatory responsibilities regarding operations on lands leased for geothermal resources under the terms of the Geothermal Steam Act of 1970. Beaver County is currently in attainment with the National Ambient Air Quality Standards (NAAQS), and the short-term increase of fugitive dust and small amounts of equipment emissions are within state air quality standards. The design features in **Appendix D** would limit fugitive dust. Any fixed generators would be permitted as required by state and local regulation through UDAQ and Beaver County.

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Migratory Bird Treaty Act (MBTA) of 1918	The MBTA prohibits the take (killing, capturing, selling, trading, and/or transport) of migratory birds and their nests or eggs without a permit. The list of protected migratory birds includes raptors.	The Proposed Action would adhere to migratory bird design features, including nest surveys, to ensure no take of migratory bird species occurs (**Appendix D**).
Endangered Species Act (ESA) of 1973	The ESA provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found. Under Section 7 of the Endangered Species Act, federal agencies must consult with the U.S. Fish and Wildlife Service (USFWS) when any action the agency carries out, funds, or authorizes (such as through a permit) may affect a listed endangered or threatened species.	The Proposed Action would not result in a take of any federally listed species, and there is no designated critical habitat for threatened and endangered species within or reasonably near the project area.
Clean Water Act of 1974, Section 401, Section 404, and Section 402	Work within Waters of the United States (WOTUS) is regulated by Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act (CWA) and falls under the jurisdiction of the US Army Corps of Engineers (USACE). No navigable waters are located within the AOI; therefore, Section 10 of the Rivers and Harbors Act is not applicable. However, other WOTUS on site; which can include streams, rivers, lakes, wetlands, bays, tidal areas, and near-shore waters; could be subject to federal jurisdiction under Section 404. Under Section 401 of the CWA, a federal agency may not issue a permit or license to conduct any activity that may result in any discharge into Waters of the United States unless a Section 401 water quality certification is issued, or certification is waived. A Section 401 water quality certification has been issued for all Nationwide Permits (NWPs) in the Sacramento District, subject to the conditions and notification requirements of the NWP, the regional conditions set forth by the USACE Utah Regulatory Office, and the conditions set forth in the USACE water quality certification approval.	Construction for the exploration activities associated with proposed project has been authorized by the Utah Division of Water Quality (UDWQ) under UPDES Permit Number UTRC08093. The SWPPP was approved by UDWQ and has been implemented for the existing exploration activities associated with the proposed project (GES 2023). The SWPPP includes measures designed to prevent excess sediment from discharging to surface waters in the analysis area. A SWPPP amendment or an additional SWPPP would be prepared and NOI submitted to obtain authorization from UDWQ for stormwater discharges associated with the proposed production project. Stormwater design features in **Appendix D** would help minimize potential impacts to surface waters.
Federal Land Policy and Management Act of 1976 (FLPMA)	FLPMA established guidelines to provide for the management, protection, multiple use, and enhancement of public lands. Section 103(e) of FLPMA defines public lands as any land and interest in land owned by the United States and administered by the Secretary of the Interior through the BLM.	The Proposed Action would meet the BLM's multiple-use and sustained yield mandate to serve present and future generations. The term "sustained yield" means the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the public lands consistent with multiple use (DOI BLM 2022)
American Indian Religious Freedom Act of 1978, EO 13175 - Consultation and Coordination with Indian Tribal Governments (2000)	The American Indian Religious Freedom Act of 1978 protects the rights of Native Americans to exercise their traditional religions by ensuring access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites.	Letters inviting Tribal Nations to engage in consultation were sent on July 2 and July 3, 2024. Consultation is on-going.
Public Rangelands Improvement Act of 1978	The Public Rangelands Improvement Act established a national policy to manage, maintain, and improve the condition of public rangelands. The project area intersects two grazing allotments.	The project area is located within the Hanson Allotment (Upper and Lower Pastures) and Milford Bench Allotment. Design features including reduced speed limits, exclusionary fencing, and reclamation of disturbed areas utilizing a BLM-approved mix would minimize potential impacts to public rangelands (**Appendix D**).

Relevant Statute, Regulation, Policy, or Plan	Relationship to the Proposed Action	Conformance of the Proposed Action
Migratory Bird Treaty Act (MBTA) of 1918	The MBTA prohibits the take (killing, capturing, selling, trading, and/or transport) of migratory birds and their nests or eggs without a permit. The list of protected migratory birds includes raptors.	The Proposed Action would adhere to migratory bird design features, including nest surveys, to ensure no take of migratory bird species occurs (**Appendix D**).
Archaeological Resources Protection Act (ARPA) of 1979	ARPA was enacted to secure, for the present and future benefit of the American people, the protection of archaeological resources and sites which are on public lands and Indian lands, and to foster increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals having collections of archaeological resources and data which were obtained before October 31, 1979 (16 U.S.C. §470aa (b)). ARPA, as amended, provides archeologists and law enforcement with tools to protect archeological resources on public lands and Indian lands.	Class III intensive pedestrian surveys have previously been conducted on several portions of the project area and would be conducted on any unsurveyed areas prior to any surface disturbance, as defined under the phased approach outlined in 36CFR800.4(b)(2). Consultation with UT SHPO and appropriate tribes would also be conducted prior to implementation. Avoidance of archaeological resources is the preferred method to address potential adverse effects and the BLM will require avoidance to the maximum extent practicable.
Utah Geothermal Resource Conservation Act, Section 73-22 (1981)	The Utah Department of Natural Resources, Utah Division of Water Rights (UDWRi) is given jurisdiction and authority over all geothermal resources in the State.	EDR would apply for exploratory, production, and injection wells by submitting the POO (**Appendix A**) and well design to the UDWRi and receive written approval before commencing with drilling operations. The specific drilling methodology, including drilling fluids, would be reviewed and approved by UDWRi as part of the geothermal drilling permit application process. Water used for drilling, completions, and testing associated with the previously approved Exploration EA has been supplied with leased water rights and approved for use by the UDWRi under an Approved Temporary Change Application.
Utah Pollutant Discharge Elimination System (UPDES) Program (1990), Utah Administrative Code R317-8-3.	Stormwater general permits are issued through the U.S. Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System (NPDES) program or the state NPDES permitting authority. Construction activities that disturb one or more acres of land must be authorized under the Utah Pollutant Discharge Elimination System (UPDES). The permit is obtained by creating a Storm Water Pollution Prevention Plan (SWPPP) and submitting a NOI to be covered under the UPDES General Storm Water Permit for Construction Activity (CGP).	Construction for the exploration activities associated with proposed project has been authorized by the UDWQ under UPDES Permit Number UTRC08093. The SWPPP was approved by UDWQ and has been implemented for the existing exploration activities associated with the proposed project (GES 2023). The SWPPP includes measures designed to prevent excess sediment from discharging to surface waters in the analysis area. A SWPPP amendment or an additional SWPPP would be prepared and NOI submitted to obtain authorization from UDWQ for stormwater discharges associated with the proposed production project. Stormwater design features in **Appendix D** would help minimize potential impacts to surface water.

Relevant Statute, Regulation, Policy, or Plan	Relationship to the Proposed Action	Conformance of the Proposed Action
Migratory Bird Treaty Act (MBTA) of 1918	The MBTA prohibits the take (killing, capturing, selling, trading, and/or transport) of migratory birds and their nests or eggs without a permit. The list of protected migratory birds includes raptors.	The Proposed Action would adhere to migratory bird design features, including nest surveys, to ensure no take of migratory bird species occurs (**Appendix D**).
Native American Graves Protection and Repatriation Act (NAGPRA; 25 U.S.C. 3001 et seq) and its implementing regulations (43 CFR part 10)	The Native American Graves Protection and Repatriation Act (Act) of November 16, 1990, recognizes the rights of lineal descendants, Indian Tribes, and Native Hawaiian organizations in Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony. • The Act and regulations also provide systematic processes to: Protect Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony; and restore Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony to lineal descendants, Indian Tribes, and Native Hawaiian organizations. • The Act and these regulations require consultation with lineal descendants, Indian Tribes, and Native Hawaiian organizations. • Consistent with the Act, these regulations require deference to the Native American traditional knowledge of lineal descendants, Indian Tribes, and Native Hawaiian organizations.	Letters inviting Tribal Nations to engage in consultation were sent on July 2 and July 3, 2024. The Tribal Nations were also invited to consult on the development of a NAGPRA Plan of Action (POA). Consultation is on-going. .A NAGPRA will be completed prior to the signing of the ROD.
Utah Code 9-9-401 – Utah Division of Indian Affairs Act; Native American Grave Protection and Repatriation Act	NAGPRA concerning jurisdiction on private or state lands.	The BLM has included steps in the NAGPRA POA that will be taken if inadvertent discoveries of human remains, or cultural items are located on private or state lands. Management and jurisdiction would fall to the Utah Division of State History Human Remains Program.
Fundamentals of Rangeland Health (43 CFR 4180) (1995, 2006).	Provides standards and guidelines developed by the BLM for rangeland health. Standards for Utah include: • Standard 1 – Upland soils exhibit permeability and infiltration rates that sustain or improve site productivity, considering the soil type, climate, and landform. • Standard 2 – Riparian/wetland areas are in proper functioning condition. Stream channel morphology and functions are appropriate to soil type, climate, and landform. • Standard 3 – Desired species, including native, threatened, endangered, and special status species are maintained at a level appropriate for the site and species involved. • Standard 4 – Water Quality: Surface water and groundwater quality, influenced by agency actions, complies with state water quality standards.	Potential impacts to rangeland health; including the condition of soils, riparian areas, vegetation, and water quality; would be minimized by implementing the design features in **Appendix D.**
Executive Order 13112, *Invasive Species* (1999)	Executive Order 13112, *Invasive Species*, directs federal agencies to use relevant programs and authorities, to the extent practicable and subject to available resources, to prevent the introduction of invasive species and provide for restoration of native species.	The BLM coordinates with County and local governments to conduct an active program for control of invasive species. All vehicles would be power-washed prior to arriving in the project area to limit the potential for the introduction of invasive species, and disturbed areas would be reclaimed utilizing a BLM-approved seed mix (**Appendix D**).

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EO 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds (2001)	The Council for the Conservation of Migratory Birds (Council) was established in 2009 by the Secretary of the Interior to oversee the implementation of the Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds. The BLM is a member of the Council. As a member of the Council, the BLM is directed to improve opportunities for federal activities to more effectively protect and conserve migratory birds.	The Proposed Action would adhere to migratory bird design features, including nest surveys, to ensure no take of migratory bird species occurs (**Appendix D**). Raptor nests found in proximity to the project area would be protected and managed according to Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances (Romin and Muck 2002), as directed by the BLM. Raptor nests would be protected through incorporation of spatial buffers and seasonal restrictions (**Appendix D**).
Energy Policy Act of 2005 (Title II Section 225) (1999)	In August 2005, the U.S. Congress enacted the Energy Policy Act of 2005, Public Law 109-58, which recognizes the increasing demand for renewable energy and the need to facilitate leasing decisions for geothermal resources on public lands (BLM 2008).	The Proposed Action would meet the BLM's regulatory responsibilities regarding facilitating and expediting leasing decisions and permitting for geothermal resources on public lands.
Programmatic EIS (PEIS) for Geothermal Leasing in the Western United States (2008)	In furtherance of Section 225 of Energy Policy Act of 2005, the U.S. Department of Interior (DOI) BLM and the U.S. Department of Agriculture U.S. Forest Service (USFS) finalized a Programmatic EIS (PEIS) for Geothermal Leasing in the Western United States to identify public lands open to geothermal leasing.	The BLM lands within the project area are included in the PEIS and have been identified as open to geothermal leasing. The Proposed Action would meet the need for the Federal action identified in the PEIS to "facilitate geothermal resource leasing in an environmentally responsible manner to help meet the increasing interest in geothermal energy development on public and NFS lands in the western United States" (USFS and BLM 2008).
Paleontological Resources Preservation Act of 2009 (PRPA)	PRPA directs the Department of Agriculture (U.S. Forest Service) and the Department of the Interior (National Park Service, Bureau of Land Management, Bureau of Reclamation, and Fish and Wildlife Service) to manage and protect paleontological resources on federal land using scientific principles and expertise.	The Proposed Action would comply with all BLM recommendations to protect paleontological resources on federal land (**Appendix D**).
Secretarial Order 3362, *Big Game* (2018)	Secretarial Order 3362 recognizes state authority to manage big game species including improving habitat quality in western big game winter range and migration corridors.	The Proposed Action would comply with all UDWR recommendations for minimizing potential impacts to big game species (**Appendix D**). The Proposed Action would comply with all BLM recommendations to protect paleontological resources on federal land (**Appendix D**).

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Utah Administrative Code R655-1 - Wells Used for the Discovery and Production of Geothermal Energy in the State of Utah (2018)	The UDWRi has jurisdiction and authority to require that all wells for the discovery and production of water and steam at temperatures greater than 120 degrees centigrade to be used for geothermal energy production in the State of Utah, be drilled, operated, maintained, and abandoned in a manner as to safeguard life, health, property, the public welfare, and to encourage maximum economic recovery.	EDR would apply for production wells by submitting the POO (**Appendix A**) and well design to the UDWRi and receive written approval before commencing with drilling operations. Water used for drilling, completions, and testing associated with the previously approved Exploration EA has been supplied with leased water rights and approved for use by the UDWRi under an Approved Temporary Change Application. EDR intends to apply for a non-consumptive appropriation with the UDWRi for the long-term use of supplying makeup water and production water. Alternatively, or in-concert with the non-consumptive appropriation, EDR may continue to meet water supply needs with leased water rights.
Utah Code, Section 19-2 (Utah Air Conservation Act) (2020)	It is the policy of this state and the purpose of this chapter to achieve and maintain levels of air quality which will protect human health and safety, and to the greatest degree practicable, prevent injury to plant and animal life and property, foster the comfort and convenience of the people, promote the economic and social development of this state, and facilitate the enjoyment of the natural attractions of this state. Persons engaged in operations that result in air pollution may be required to install, maintain, and use emission monitoring devices, as the board finds necessary.	The short-term increase of fugitive dust and small of amounts of equipment emissions from the Proposed Action are within state air quality standards. The design features in **Appendix D** would limit fugitive dust and equipment emissions. Any fixed generators would be permitted as required by state and local regulation through UDAQ and Beaver County.

The Proposed Action would comply with Utah Code regarding geothermal resources. Water used for drilling, completions, and testing associated with the previously approved Exploration EA has been supplied with leased water rights and approved for use by the UDWRi under an Approved Temporary Change Application. EDR intends to apply for a non-consumptive appropriation with the UDWRi for the long-term use of supplying makeup water and production water. Alternatively, or in-concert with the non-consumptive appropriation, EDR may continue to meet water supply needs with leased water rights. The Proposed Action would also be consistent with applicable Beaver County Ordinances including construction codes, public health and sanitation codes, public safety codes, and county use and zoning ordinances.

1.6. ISSUES IDENTIFIED FOR ANALYSIS

The BLM Interdisciplinary (ID) Team screened the Proposed Action and completed an ID Team Checklist (**Appendix C**) to identify resource values and land uses that would be affected by implementation of the Proposed Action and that would therefore require analysis in the EA.

The following potential issues were identified by the BLM ID Team on the ID Team Checklist during the internal scoping process:

- **Geology / Mineral Resources / Energy Production:** How would the proposed project affect Energy Production?

- **Soils**: How would the proposed project affect soils, including potential loss of soil though removal and erosion, as well as compaction?
- **Vegetation** How would surface disturbance from construction of the proposed project affect vegetation within the analysis area?
- **Wildlife & Fish** (Migratory Birds): How would the proposed project affect local migratory bird populations?
- **Wildlife & Fish** (Big Game Species): How would the proposed project impact pronghorn, the quality of their habitat, and the cumulative impacts to their habitat connectivity / movement corridors in the Milford Valley area?
- **Wildlife & Fish** (excluding USFWS-designated species): How would the proposed project impact kit fox, the quality of their habitat, and the cumulative impacts to their habitat connectivity in the Milford Valley area??

These issues are discussed in detail in Chapter 3, Affected Environment and Environmental Consequences.

1.7. ISSUES IDENTIFIED BUT DISMISSED FROM DETAILED ANALYSIS

Issues and resources that are present but would not be affected to a degree that require detailed analysis were dismissed from further analysis in this EA (see **Appendix C**). The following issues were identified but dismissed from detailed analysis based on field surveys or modifications to the Proposed Action:

Invasive Species/Noxious Weeds: How would the Proposed Action affect the spread of noxious weeds and invasive species?

Executive Order 13112, Invasive Species, directs federal agencies to use relevant programs and authorities, to the extent practicable and subject to available resources, to prevent the introduction of invasive species and provide for restoration of native species. The BLM coordinates with County and local governments to conduct an active program for control of invasive species. The Proposed Action has the potential to spread existing noxious weed populations within and adjacent to the project area by seed transport via equipment and vehicle movement. Based on the design features outlined in **Appendix D (**under Air, Soil, and Vegetation Design Features), impacts from Invasive Species and Noxious Weeds would be reduced to a level not requiring detailed analysis; therefore, this issue was dismissed from further analysis.

Cultural Resources: How would project activities and presence of the associated infrastructure affect historic properties, TCPs, and other cultural resources?

A literature review was conducted for the Physical APE with a 0.5-mile buffer to identify known cultural resources and the potential for cultural resources in areas not previously inventoried. Information related to the literature review is contained in the Administrative Record for this environmental assessment.

On 7/15/2024, SHPO concurred with the plan for phasing this undertaking and concurred with the APE and identification efforts. Following the phased approach, Class III cultural resource inventories will be conducted and consultation with UT SHPO and appropriate tribes will be conducted prior to implementation. There will be no adverse effect to historic properties (i.e. those cultural resources listed in or determined eligible for the NRHP). Avoidance of historic properties is the preferred method to address potential adverse effects and the BLM will require avoidance to the maximum extent practicable. Impacts to historic properties from project activities would potentially include those that do not alter characteristics that qualify the site for listing in the NRHP. Cultural resources determined Not Eligible to the NRHP may

be impacted by project activities. Design features have been added in **Appendix D** to reduce potential impacts to these resources.

On 7/2/2024 and 7/3/2024, the BLM initiated consultation and coordination with the following of Native American tribal groups by sending letters to inform the tribes of the proposed action and the determination of No Adverse Effect to Historic Properties. The Tribal Nations were also invited to consult on the development of a NAGPRA Plan of Action:

- Hopi Tribe
- Kaibab Band of Paiute Indians
- Moapa Band of Paiute Indians
- Paiute Indian Tribe of Utah (Cedar Band of Paiutes, Kanosh Band of Paiutes, Koosharem Band of Paiutes, Indian Peaks Band of Paiutes, and Shivwits Band of Paiutes)
- Ute Indian Tribe of the Uintah & Ouray Reservation
- Ute Mountain Ute Tribe
- Ute Mountain Ute Tribe White Mesa Community
- Pueblo of Zuni
- Navajo Nation

Should cultural resource concerns arise that are not addressed in the EA or design features, adaptive management will be used through coordination with concerned parties to best protect identified cultural resources.

Native American Concerns: How would project activities and presence of the associated infrastructure affect historic properties, TCPS, and other cultural resources?

The BLM has identified the entire Project Area of Interest (AOI) to consult upon regarding Native American concerns.

There are no known Tribal resources, including sacred sites, within the project area. Tribal Interests and traditional cultural resources are identified primarily through consultations with federally recognized Indian tribes on a government-to-government basis (Executive Order 13084 and Executive Memorandum of April 29, 1994, on Government-to-Government Relations with Native American Tribal Governments). In addition, while many traditional cultural resources are well known, some locations or resources may be privileged information that is restricted to specific practitioners or clans. For tribes, maintaining confidentiality and customs regarding traditional knowledge may take precedence over identifying and evaluating these resources, unless they are in imminent danger of damage or destruction (USFS and BLM 2008).

All tribal consultation for this project is being conducted on a Government-to-Government basis by the BLM. Letters inviting Native American tribal groups to engage in consultation were sent on July 2 and 3, 2024. The following tribes were consulted to identify any areas of traditional religious and/or cultural importance that may be affected by the Proposed Action and invited to consult on the development of a NAGPRA plan of action (POA):

- Hopi Tribe
- Kaibab Band of Paiute Indians
- Moapa Band of Paiute Indians
- Paiute Indian Tribe of Utah (Cedar Band of Paiutes, Kanosh Band of Paiutes, Koosharem Band of Paiutes, Indian Peaks Band of Paiutes, and Shivwits Band of Paiutes)
- Ute Indian Tribe of the Uintah & Ouray Reservation
- Ute Mountain Ute Tribe

- Ute Mountain Ute Tribe White Mesa Community
- Pueblo of Zuni
- Navajo Nation

As of 08/21/2024, the BLM has not received official correspondence from the above listed tribes citing any critical concerns. Consultation will remain ongoing through a government-to-government basis.

Additional cultural resources and Native American concerns may be analyzed as new correspondence is received. Design features (**Appendix D**) may be updated prior to the decision determination in order to address Native American concerns.

A Plan of Action (POA) has been developed for inadvertent discovery of Native American human remains and funerary items to comply with the Native American Graves Protection and Repatriation Act (NAGPRA 25 U.S.C. §§ 3001, *et seq.*) and its implementing regulations (43 CFR §§ 10, *et seq).* The POA will be included in the administrative record for this environmental assessment once it is complete and prior to a decision determination.

CHAPTER 2.0. PROPOSED ACTION AND NO ACTION ALTERNATIVE

This EA analyzes the potential effects of implementing the No Action Alternative and the Proposed Action. The No Action Alternative is considered and analyzed to provide a baseline against which to compare the impacts of the Proposed Action. No other alternatives were brought forward for detailed analysis as no other alternatives were identified that would meet the purpose and need.

2.1. NO ACTION ALTERNATIVE

Under the No Action Alternative, the BLM would not approve the proposed Cape Geothermal Power Project, and the ROW for an off-lease portion of a power transmission corridor would not be granted (**Appendix A**). The proposed production of geothermal resources on BLM managed public lands would not occur. The proposed power plants, well pads, transmission lines, pipelines, and access roads would not be constructed on BLM managed public lands, and associated surface disturbance would not occur. Some geothermal development would still occur on private property; however, the development of the geothermal resource would be restricted. Exploration and future development on the geothermal leases would still be able to occur under the current geothermal lease rights; potential impacts from these activities would be assessed through a separate NEPA analysis.

2.2. PROPOSED ACTION

The Proposed Action, as described in EDR's POO (**Appendix A**), is the next development step following the previously completed Cape Modern Geothermal Exploration Project. The Proposed Action includes the construction of an estimated 23 well pads and up to 20 modular geothermal power plants and ancillary facilities (**Figure 1-2**). The Proposed Action would include associated on-lease access road construction or improvements, a power distribution network composed of sub-transmission lines, an electrical switchyard, a general tie-in transmission line, a geothermal fluid pipeline gathering system, and the construction and maintenance of off-lease well pads, access roads, and power transmission corridors. The power plants, electrical switchyard, and associated laydown yards would all be located on private land near the proposed well pad locations.

An estimated 320 geothermal production and injection wells would be drilled from an estimated 20 production well pad locations (23 total pads, three of which will be for observation). The development strategy involves drilling multiple horizontal injection and production wells to recover the geothermal resource. In addition to the horizontal wells, several vertical observation wells would be drilled for the purposes of measuring the formation temperature, verifying the geology of the formation, and potentially hosting data acquisition systems such as fiber optic cables or temporary downhole geophones. Three (3) additional well pads are currently designed for vertical observation wells, though additional vertical observation wells may be drilled from other pads. A typical well pad layout is provided as **Figure 2-1**. Approximate well locations are included in **Table 2-1**.

EDR would carry out these actions in a phased approach and power plants, well pads, access roads, transmission lines, and ancillary facilities would be constructed individually or in groups of two or three, rather than all power plants and well pads constructed at one time. The Proposed Action would include well drilling, well stimulation, well completion, and well testing as described in the attached POO (**Appendix A**), and in subsequent sub-sections of this EA. The maximum surface disturbance associated with the project during construction would be approximately 631 acres, 1.8% of the total AOI. Of the maximum surface disturbance, approximately 155 acres (~25% of the project footprint) are planned to be located on BLM surface. The development on BLM surface will include well pads, access roads, distribution lines, transmission lines, and pipelines. The remaining 476 acres (~75% of the project footprint within the larger AOI) are planned to be located on private surface. The development on private surface will include all

power plants and the electrical switchyard, as well as additional well pads, access roads, distribution lines, transmission lines, and pipelines.

Prior to the initiation of drilling activities, EDR would submit a BLM Geothermal Drilling Permit (BLM Form 3260-2) and drilling program for the specified geothermal production and observation well site locations. Additionally, EDR would obtain the appropriate approvals from the UDWRi. After all appropriate federal, state, and local permits necessary for any action are received, well pad preparation and drilling activities would occur. EDR would also submit a separate Plan of Utilization (POU) and obtain a commercial use permit from the BLM before producing geothermal fluids for commercial use.

2.2.1. SEISMIC MONITORING

Three borehole seismic monitoring stations and arrays of temporary surface seismic monitors have been installed on federal surface under the previously approved Exploration EA. Target locations for additional monitors would be identified as the geothermal resource continues to be explored, and would be placed on federal, state, or private property within the AOI. Seismic monitors would be used to gather high-resolution micro-seismic data during well completion, testing, and/or operational activities. Cumulative site disturbance for all seismic monitors combined would be less than 1 acre.

Borehole seismic monitoring stations would consist of an approximately 50- to 300-foot-deep drill hole installed by a truck-mounted over-the-road (OTR) drill rig, with no drill pad constructed. The station would be powered by a small solar panel and would host either a broadband geophone or accelerometers. An area approximately 10 feet by 10 feet around the station would be fenced for livestock exclusion. Where possible, sites would be placed along existing or planned roads. To install, geophone assemblies would typically be placed in a shallow hole and covered with a thin layer of dirt. Geophones would be transported by foot or by vehicle to each installation site.

Other seismic monitors or related surveys may be implemented, such as Magnetotelluric (MT) surveys, Surface Orbital Vibrators (SOVs), gravity surveys, or seismic surveys to further analyze the geothermal resource and inform project development. Any such seismic monitoring locations or surveys anticipated to cause surface disturbance on federal property in the AOI would be surveyed prior to construction to avoid additional impacts to biological or cultural resources and would be subject to BLM sundry notice and approval.

2.2.2. SITE PREPARATION

Site preparation would include surveying, staking, geotechnical evaluation, clearing/grubbing, and grading per required drainage plans. All tests that may cause surface disturbance on federal property within the AOI would be surveyed prior to construction to avoid additional impacts to biological and cultural resources and would be subject to BLM sundry notice and approval.

2.2.2.1. *Geotechnical Studies, Surveying, and Staking*

Geotechnical studies may take place at all stationary structure or foundation locations, as well as periodically throughout the proposed facility locations to ensure safe/accurate foundation designs. To conduct a geotechnical study, a drill on a rubber tired OTR truck would be driven overland to the target area, and a small hole would be drilled into the subsurface to analyze the soil conditions. Holes would be backfilled after drilling with cuttings material removed from boring. Target locations would be sited to avoid cultural impacts and reduce ecological disturbance.

Surveying would be performed by a licensed surveyor and staking would be done to ensure consistency between the planned and actual locations.

2.2.2.2. *Vegetation Removal, Clearing, Grading, and Excavation*

Well pad and surface facility preparation activities would include vegetation clearing, earthwork, drainage, and other improvements necessary for efficient and safe operation and for fire prevention. Only those facilities that have been surveyed and scheduled to be constructed would be cleared. Clearing would include removal of vegetation, and organic material, stumps, brush, and slash, which would either be removed and taken to an appropriate dump site or left on-site. Topsoil would be stripped (typically to the rooting depth) and either removed to an appropriate dump site or salvaged during the construction. Salvaged topsoil (and cleared organic material, stumps, brush, and slash, if saved) would be stockpiled for use during subsequent reclamation. Soil stockpiles that are to be stored for more than 6 months would be stabilized with vegetative cover.

Vegetation removal would be conducted outside of the primary migratory bird nesting season as required in the associated design features. If project activities are unavoidable during this time frame, nesting surveys for migratory birds would be conducted by a qualified biologist to ensure no active nests are impacted. Additional biological surveys for BLM-sensitive species (kit fox, burrowing owl, etc.) would be implemented as required by the BLM design features (**Appendix D**) prior to new surface disturbance on federal lands.

Each well pad or surface facility footprint would be prepared and graded to create a level pad. Stormwater runoff from undisturbed areas around the constructed pads would be directed either into a reserve pit, stormwater containment, or back onto undisturbed ground, in a manner consistent with Best Management Practices (BMPs) for stormwater. Stormwater containment structures, where used, would be designed for a 100-year storm. Disturbance boundary erosion mitigation measures, also called Erosional Control Devices (ECDs) may include silt fencing, drainage bars, check dams, berms, and/or seeding.

Reserve pits and stormwater containment structures would be constructed in accordance with BMPs identified in the "Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (Gold Book)" (Fourth Edition – Revised 2007). A SWPPP amendment or an additional SWPPP would be implemented for the construction activities associated with the proposed project. The SWPPP would include measures designed to prevent excess sediment from discharging to surface waters in the analysis area.

2.2.3. GEOTHERMAL WELL FIELD

The proposed geothermal well field will be composed of 20 production pads and 3 observation pads (**Figure 2-1** and **Table 2-1**). An estimated 320 geothermal production and injection wells would be drilled from 20 production well pad locations. Three (3) additional observation well pads are currently designed for vertical observation wells, though additional vertical observation wells may be drilled from other pads.

2.2.3.1. *Well Pads*

The target well pad locations identified in **Table 2-1** below may be relocated to other federal, state, or private property within the AOI as new leasing arrangements are finalized and as the geothermal resource continues to be explored. Relocations of project components on federal property within the AOI would be surveyed to avoid additional impacts to biological or cultural resources and would be subject to BLM sundry notice and approval.

Table 2-1. Legal Descriptions of Proposed Well Pad Locations

Well Pad No.	Lease Type (Federal / Private)	Status	Pad Name	Lease No	Legal Description	Lat WGS 84	Long WGS 84	Acres (Est.)
1	Private	Built	Bearskin	Smithfield	S31 T26S R9W	38.51050°N	112.91538°W	6.540
2	BLM	Built	Gold	UTU-095314	S36 T26S R10W	38.50259°N	112.91819°W	7.087
3	BLM	Built	Frisco	UTU-095314	S1 T27S R10W	38.49521°N	112.91815°W	8.472
4	BLM	Built	Delano	UTU-095314	S6 T27S R9W	38.49672°N	112.90509°W	8.074
5	BLM	Planned	Belknap	UTU-095314	S1 T27S R10W	38.49089°N	112.91826°W	6.715
6	BLM	Planned	Granite	UTU-095314	S12 T27S R10W	38.48277°N	112.91842°W	6.715
7	BLM	Built	Winkler	UTU-095314	S12 T27S R10W	38.47781°N	112.91826°W	5.682
8	Private	Planned	TBD	Smithfield	S26 T26S R10W	38.52794°N	112.93664°W	6.715
9	Private	Planned	TBD	Smithfield	S26 T26S R10W	38.51978°N	112.93642°W	6.715
10	Private	Planned	TBD	Smithfield	S19 T26S R9W	38.53109°N	112.89985°W	6.715
11	Private	Planned	TBD	Smithfield	S19 T26S R9W	38.53641°N	112.91585°W	6.715
12	Private	Planned	TBD	Smithfield	S19 T26S R9W	38.52960°N	112.91608°W	6.715
13	BLM	Planned	TBD	UTUT105295000	S30 T26S R9W	38.52532°N	112.91518°W	6.715
14	Private	Planned	TBD	Smithfield	S26 T26S R10W	38.51684°N	112.93642°W	6.715
15	BLM	Planned	TBD	UTUT105295000	S30 T26S R9W	38.51542°N	112.91590°W	6.715
16	Private	Planned	TBD	Machris	S36 T26S R10W	38.50444°N	112.93450°W	6.715
17	Private	Planned	TBD	Smithfield	S2 T27S R10W	38.49278°N	112.93696°W	6.715
18	Private	Planned	TBD	Smithfield	S5 T27S R9W	38.49036°N	112.89700°W	6.715
19	BLM	Planned	Signal	UTU-095314	T8 T27S R9W	38.48299°N	112.89685°W	6.715
20	BLM	Planned	TBD	UTU-095314	T8 T27S R9W	38.47969°N	112.89718°W	6.715
21	BLM	Planned	TBD	UTU-095314	T8 T27S R9W	38.47224°N	112.89706°W	6.715
22	Private	Planned	TBD	Smithfield	S18 T26S R9W	38.54545°N	112.91597°W	6.715
23	BLM	Planned	TBD	UTU-095314	S8 T27S R9W	38.47390°N	112.88856°W	6.715

Site preparation for well pads would take place as described in Section 2.2.2. Well pads would be constructed incrementally, 1 to 3 pads at a time, before drilling activity begins. Each well pad would be approximately 400 feet by 600 feet (approximately 5.5 acres per pad) with 25 feet additional around the entire perimeter for topsoil and other soil storage, resulting in 450 feet by 650 feet (approximately 6.7 acres per pad) disturbance for each pad (**Table 2-1**). Well pads may be fenced once they are converted from exploration pads to production pads after consultation and coordination with BLM. Actual dimensions of the well pads would be modified to best match the specific physical and environmental characteristics of the site and to minimize grading. Wells would be drilled in phases. Well sites deemed by the operator to be commercially non-viable would be reclaimed as described in Section 2.2.10.

Multiple wells would be drilled from each production pad to minimize surface disturbance. In some cases, drilling an excess number of wells from a single pad may require increasing the dimensions of the well pad; however, this method would require fewer total well pads to complete the project, which would result in a reduction of the total surface disturbance. The total surface disturbance associated with well pad construction within the AOI would be approximately 156 acres (7.1 acres average per built pad plus 6.7 acres per planned pad). Of the total surface disturbance associated with well pad

construction, approximately 83 acres (53%) is anticipated to be located on BLM lands, with the remaining approximately 73 acres (47%) anticipated to be located on private property. A summary of surface disturbance by project component is provided in Section 2.2.11.

Reserve pits would be constructed on each pad for the containment and temporary storage of water, drill cuttings, and circulating drilling fluid during drilling operations. Reserve pits would be constructed in accordance with best management practices identified in the Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (The Gold Book) (BLM 2007). Geothermal fluid produced from the well during flow testing would also drain to the reserve pit. The reserve pits would be fenced with an eight-foot exclosure fence on three sides and then fenced on the fourth side once drilling has been completed to prevent access by persons, wildlife, or livestock (BLM 2007). Exclosure fencing would consist of chain-link fence or other BLM-approved fencing. The fence would remain in place until pit reclamation begins following well completion and testing activities. To prevent livestock, wildlife, and persons from becoming entrapped, one side of the reserve pit walls would be sloped at an approximate 30 percent incline. The reserve pit would measure approximately 150 feet by 300 feet by 20 feet deep. Actual dimensions of the reserve pit would be modified to best match the specific physical and environmental characteristics of the site and to minimize grading.

Once drilling is complete, the shoulders of the well pad could be reclaimed, but the majority of the pad must be kept clear for ongoing operations and the potential need to work on or re-drill the wells contained therein. Disturbed areas that are no longer being used would be reclaimed.

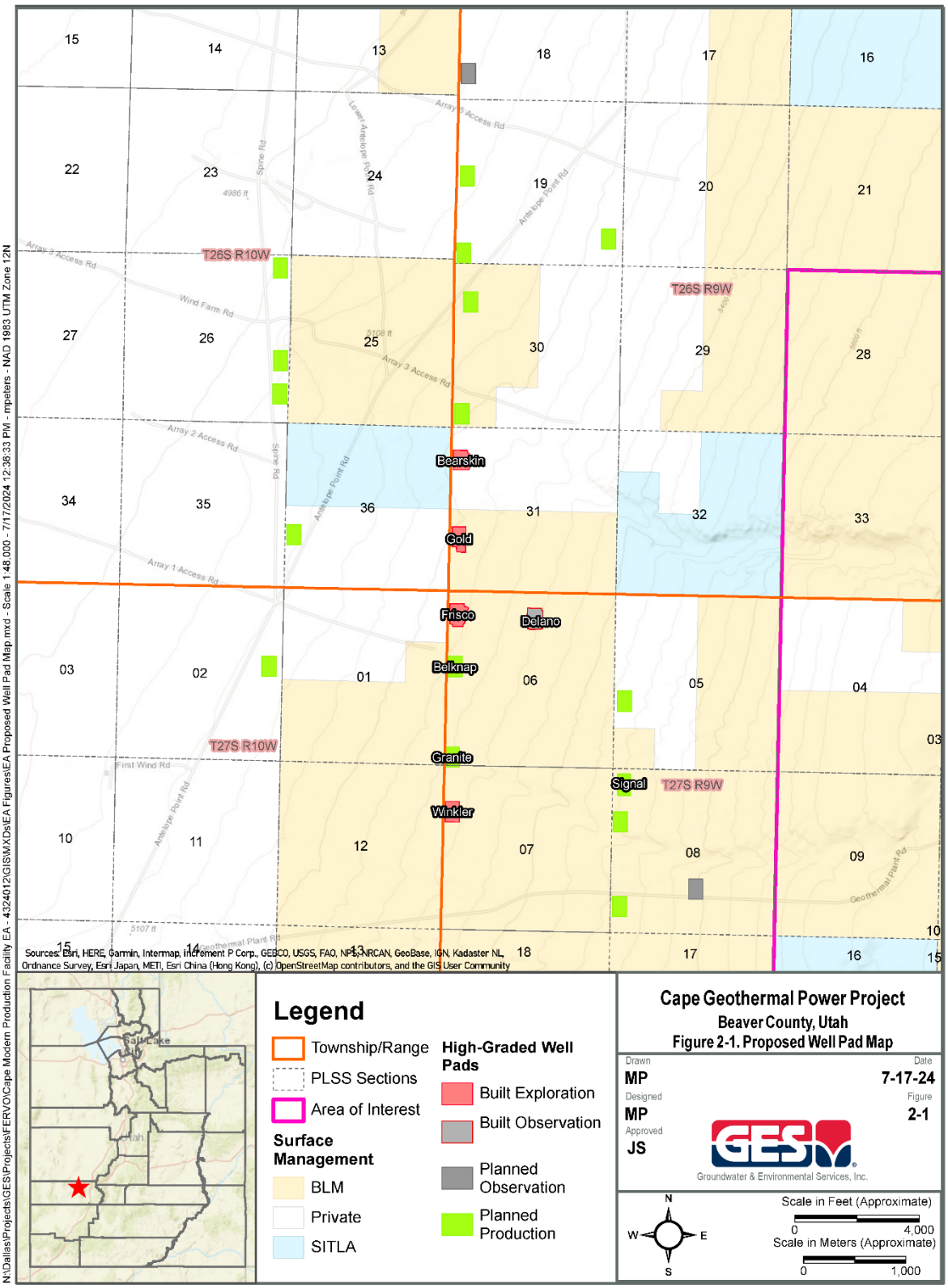

Figure 2-1. Proposed Well Pad Map.

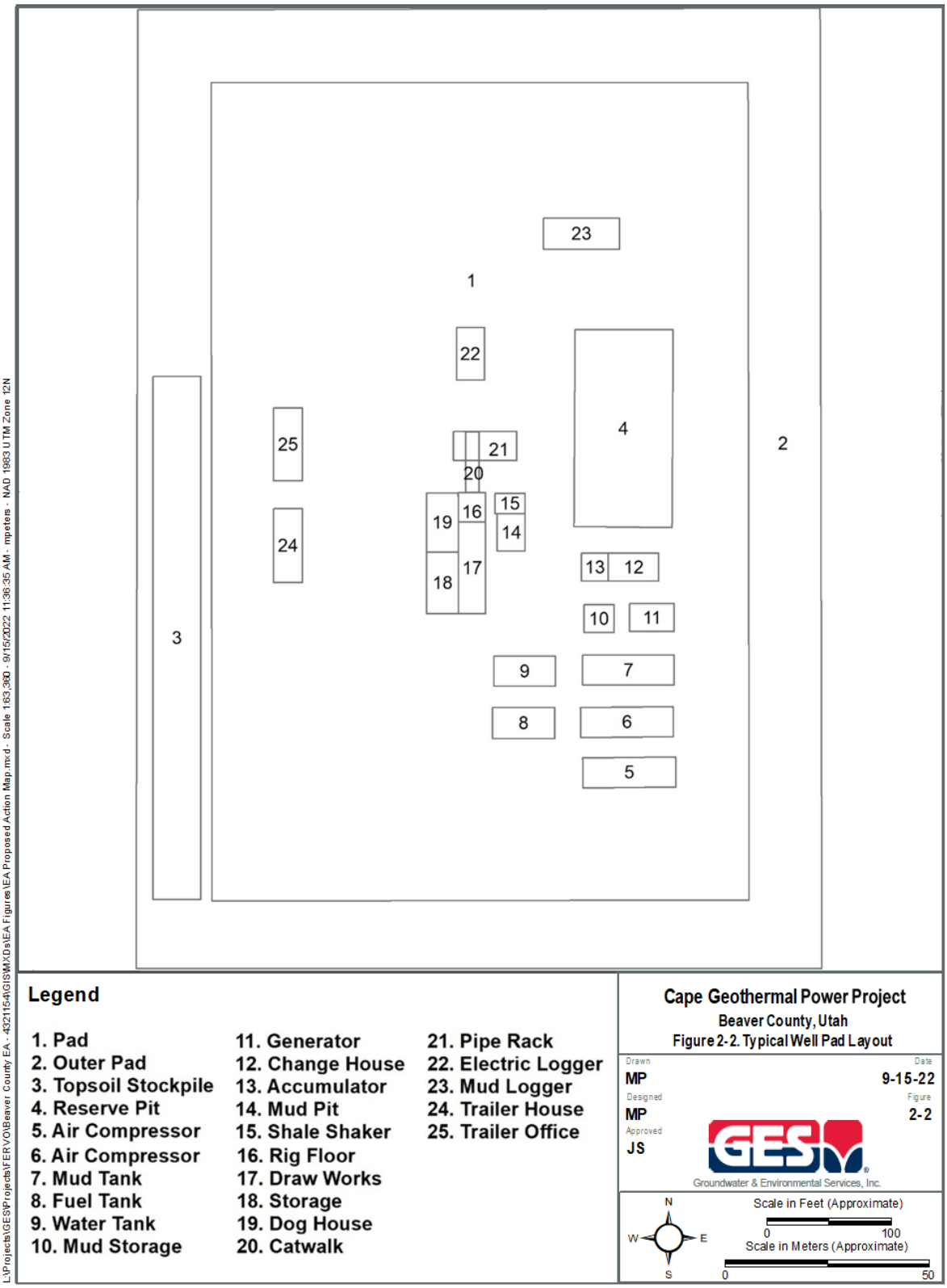

Figure 2-2. Typical Well Pad Layout

2.2.3.2. *Well Drilling*

Geothermal wells would be drilled and tested individually or in groups of two or three and would be drilled in succession, rather than all wells drilled at the same time. A large drilling rig (approximately 170 ft. in height) would be used to drill the proposed geothermal wells.

A drilling supervisor would be on-site at all times. The drilling crew would live on-site during the drilling operations in self-contained, mobile bunkhouses or portable trailers, placed on the active well pad or on an inactive well pad nearby. Alternatively, the drilling crew may acquire accommodations in Milford, Utah, depending on lodging availability. Drilling crews for a 24-hour operation typically include up to 23 individuals.

Blow-out prevention (BOP) equipment would be utilized while drilling below the surface casing and testing of BOP equipment would be performed as per BLM regulatory requirements. The well bore would be drilled using non-toxic, temperature-stable, water-based drilling fluid that would include bentonite clay or polymers for increased viscosity and carrying capacity. If required to improve the drilling operations, EDR may utilize underbalanced drilling with air, mist, foam, or aerated mud.

Variable concentrations of the additives described in this paragraph would be added to the drilling fluids as needed to improve drilling performance, prevent corrosion, increase mud weight, and prevent mud loss. While some of the mud additives may be hazardous substances in concentrated form, they would only be used in low concentrations that would not render the drilling mud hazardous or toxic. The specific drilling methodology, including drilling fluids and additives, would be reviewed and approved by UDWRi as part of the geothermal drilling permit application process (R655-1-2 UAC). Injection wells would also be approved during the geothermal drilling permit process and would comply with R655-1-5 UAC.

Target depths at the project geothermal field will initially range between 5,000 and 18,000 feet below ground surface (True Vertical Depth, TVD) but would be adjusted as new well data, well testing results, improved drilling technologies, and increased understanding of the subsurface become available. Directional drilling would be employed to drill horizontal geothermal wells. Well casing would meet all requirements outlined in Geothermal Resources Operational Order No. 2, where the surface casing string would be set at no less than 200 feet TVD to prevent commingling of the geothermal fluids with underground aquifers (DOI Geological Survey Conservation Division 1975) or with Onshore Oil and Gas Operational Order No. 2 (BLM 1988), or as directed by federal and state regulators.

The horizontal injection and production wells would be designed to target a TVD that meets the resource temperature requirements for commercial production. The wells would be drilled vertically to a predetermined kick-off point, at which point directional drilling techniques would be employed, as detailed in **Appendix A**.

The vertical observation wells would be drilled to a similar depth as the target TVD of nearby horizontal wells. In some cases, the vertical observation wells may be drilled deeper than the target TVD of nearby horizontal wells, to further characterize the resource. Observation wells may also be drilled in non-vertical geometries, such as S-curve or slant well geometries.

Each well may need to be worked over or be redrilled. Depending on the circumstances encountered, working over a well may consist of lifting the fluid in the well column with air or gas or stimulation of the formation using fresh water and solid materials like sand. Well redrilling would consist of:

1. Reentering and redrilling the existing well bore;

2. Reentering the existing well bore and drilling and casing a new well bore; or
3. Sliding the rig over a few feet on the same well pad and drilling a new well bore through a new conductor casing.

While the drill rig is still over the well, the residual drilling mud and cuttings would flow from the well bore and be discharged to the reserve pit. A single well may be drilled by more than one drilling rig, where for example the surface casing is set by a dedicated smaller rig prior to the main drilling rig arriving on location. Well completion details are provided in **Appendix A**.

2.2.3.3. *Geothermal Well Testing*

Short-term well tests may be performed on wells. The short-term well tests would last up to seven days on average. A typical short-term well test would involve injecting and/or producing fluid at rates sufficient for commercial electricity generation, dependent on the hydraulic conductivity of the formation. One or more long-term flow test(s) of each well drilled would be conducted in addition to the short-term flow test(s), to determine more accurately long-term well and geothermal reservoir productivity. Long-term well tests would last roughly 30 to 40 days on average. In some cases, short-term well testing may immediately proceed, and be indistinct from, long-term well testing. A typical long-term well test would be similar in function to a short-term well test, as-described above. Water Sourcing, Usage, and Storage

The water requirements typically vary considerably between the drilling, completion, and well testing phases for a given well – estimates of water volumes required per well during each phase are described in **Appendix A**.

Water necessary for these activities would be obtained from shallow water well(s) drilled from one or more proposed drill sites, after acquiring water rights and filing a change application for use of those rights with UDWRi, where each well location would be determined upon individual need. Each water well would be temporary, drilled by a licensed water well driller, and cemented with casing to provide a sanitary seal at the surface. The well would be drilled between 100 and 3,000 feet below the surface. Once no longer necessary, the well would be plugged and abandoned in accordance with Utah Administrative Code R655-4-14, with cement plugs across the bottom of the casing and, if needed, with additional plugs to isolate individual producing zones as necessary. Actual water well sizing and depths drilled may be modified as field conditions require, as allowed by UDWRi permits and regulations.

Drilling and completion water may be pumped from source locations to dedicated water storage impoundments, and from there pumped to well pads via a network of temporary water pipelines, either placed at ground surface with no disturbance, or buried in a shallow trench. Existing water storage impoundments are depicted on **Figure 1-2**. Buried temporary water pipelines would be sited along corridors surveyed prior to construction to avoid additional impacts to biological or cultural resources and would be placed parallel to access roads or other planned disturbance corridors to decrease overall surface disturbance. Where distances from water storage impoundments to well pads are prohibitively long, additional water storage impoundments may be constructed, which would also be surveyed to avoid additional impacts to biological or cultural resources. Inactive well pad reserve pits would be used for water storage and/or pump staging. One or more portable water tank(s) may be maintained on the well sites during drilling operations.

Water used for drilling, completions, and testing associated with the previously approved Exploration EA has been supplied with leased water rights and approved for use by the UDWRi under an Approved Temporary Change Application. Water used during power generation for injection and production is described in Section 2.2.5.1 and in **Appendix A**.

2.2.3.4. *Wellhead Installation and Operations Preparation*

After well drilling and completions are concluded and the wells are determined to be commercially viable, the wells and well pad would be converted to operational use by allowing geothermal fluid to be cycled from power plants to injection wells and recovered through production wells. Electric pumps would be installed and supplied with power via buried, cable-tray, or overhead electric sub-transmission lines. Unused areas of the well pad or wells that are no viable would be reclaimed with topsoil and BLM-approved seeding.

Prior to power generation, exploration wells developed under the previously approved Exploration EA that EDR deems to have commercial potential as injection wells would be converted to Class V Injection Wells under a UDWRi Underground Injection Control (UIC) permit.

2.2.4. POWER PLANT FACILITIES ON PRIVATE LAND

Up to 20 binary geothermal energy plants are proposed to be constructed in multiple phases on private land within the AOI (**Figure 1-2** and **Table 2-2**). During power generation, treated groundwater (hereafter referred to as 'geothermal fluid') is cycled through an underground Enhanced Geothermal System (EGS) to extract heat from the reservoir, which is then cycled through the binary plants.

During the initial phase of power plant construction, EDR would construct three Organic Rankine Cycle (ORC) power generation units. This initial phase of power plant construction would include the construction of power plant units 1, 2, and 3, the central switchyard, and transmission line, as well as associated laydown yards, sub-transmission lines, and a geothermal fluid pipeline system. The production well pads from which heated geothermal fluid will be supplied to the initial power generation units have been constructed under the previously approved Exploration EA and would be repurposed from their original use as exploration well drilling platforms without additional surface disturbance.

During subsequent phases of power plant construction, EDR would construct up to 17 additional power generation stations. The power plants would all be located on private land near the proposed well pad locations. The target locations identified in **Table 2-2** below may be relocated to other state or private property within the AOI as new leasing arrangements are finalized and as the geothermal resource continues to be explored. No power plant would be placed on BLM lands.

Table 2-2. Proposed Power Plant and Lay Down Yards Target Sites

Power Plant Unit No	Lease Type (Federal / Private)	Status	Legal Description	Lat WGS 84	Long WGS 84	Estimated Acres (Including Temporary Lay Downs)
1	Private	Designed	T.26S., R.09W., S31	38.50910°N	112.91524°W	18.03
2	Private	Designed	T.26S., R.10W., S36	38.50431°N	112.91888°W	26.26
3	Private	Designed	T.26S., R.10W., S36	38.50244°N	112.91884°W	26.10
4	Private	Planned	T.26S., R.10W., S23	38.53012°N	112.94103°W	12.92
5	Private	Planned	T.26S., R.10W., S28	38.52807°N	112.94097°W	12.92
6	Private	Planned	T.26S., R.10W., S28	38.52600°N	112.94092°W	12.92
7	Private	Planned	T.26S., R.09W., S19	38.53292°N	112.90638°W	12.92
8	Private	Planned	T.26S., R.09W., S19	38.53159°N	112.90438°W	12.92
9	Private	Planned	T.26S., R.09W., S19	38.53135°N	112.90808°W	12.92
10	Private	Planned	T.26S., R.09W., S19	38.53002°N	112.90610°W	12.92
11	Private	Planned	T.26S., R.10W., S36	38.50492°N	112.92803°W	12.92

12	Private	Planned	T.26S., R.09W., S31	38.50839°N	112.91223°W	12.92
13	Private	Planned	T.26S., R.10W., S36	38.50497°N	112.92540°W	12.92
14	Private	Planned	T.26S., R.10W., S36	38.50175°N	112.93057°W	12.92
15	Private	Planned	T.26S., R.10W., S36	38.50181°N	112.92794°W	12.92
16	Private	Planned	T.27S., R.10W., S02	38.49425°N	112.94246°W	12.92
17	Private	Planned	T.27S., R.09W., S05	38.48590°N	112.89155°W	12.92
18	Private	Planned	T.27S., R.09W., S05	38.48797°N	112.89160°W	12.92
19	Private	Planned	T.27S., R.09W., S05	38.49004°N	112.89167°W	12.92
20	Private	Planned	T.27S., R.09W., S05	38.48999°N	112.89430°W	12.92

2.2.4.1. *Laydown Yards and Staging Areas*

EDR would employ temporary laydown yards around the power plant construction sites that would be utilized for offloading of materials and preinstallation equipment storage. Where possible, EDR would use existing disturbed areas to site laydown yards. Laydown yards would be located adjacent to power plants on private property (**Table 2-2**). These yards would be custom shaped according to each power plant location and are anticipated to average approximately 3 acres per power plant. The laydown yards would be available for full reclamation after the construction period. Some laydown yards may be converted for permanent use if required for ongoing power generation operations.

Laydown yards / staging areas may be covered with approximately four inches of gravel where necessary to create an all-weather surface and to prevent the formation of ruts. Total aggregate (if required) for all laydown yard / staging area construction is estimated at 40,016 cubic yards (approximately 26 acres in the initial phase + approximately 47 acres in subsequent phases x 4-inch depth).

2.2.4.2. *Power Plant and Laydown Yards: Construction Procedures and Surface Disturbance*

Site preparation for power plant pads and laydown yards / staging areas would take place as described in Section 2.2.2.

Power plant pads for units 1, 2, and 3 would average approximately 650 feet by 650 feet (approximately 9.7 acres disturbance per pad). Actual dimensions of the power plant pads would be modified to best match the specific physical and environmental characteristics of the site and to minimize grading. The total surface disturbance associated with power plant pad and laydown yard / staging area construction within the AOI would be approximately 290 acres of private land (23 acres average per designed power plant plus 13 acres average per planned power plant). A summary of surface disturbance by project component is provided in Section 2.2.11.

Stormwater containment would be constructed downstream of power plant pads and laydown yards or staging areas where necessary for the containment and temporary storage of stormwater runoff. Containment structures or impoundments would be built on private property, and in accordance with BMPs identified in the "Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (The Gold Book)" (Fourth Edition – Revised 2007).

Once power plant assembly is complete and operational, laydown yards / staging areas that are no longer required for operations would be reclaimed.

2.2.4.3. *Power Plant General Design, Components, and Assembly*

A schematic detailing one concept design of an ORC power plant is shown in **Appendix A**. The concept design shown assumes a power plant footprint roughly 355 ft wide by 475 ft long by 46 ft in height. The primary visual feature in the power plant is the cooling system support structure and cooling fans.

2.2.5. GEOTHERMAL FLUID SYSTEM AND PIPELINES

A network of pipelines would be constructed to supply ground water and cycle geothermal fluid to and from geothermal well pads, water source wells, and power plants (See section 2.2.5.2). Heat would be extracted from the underground geothermal resource using geothermal fluid, cycled through the wells and power plants via pipelines. The geothermal fluid circuit would be entirely closed loop at the surface, transmitting heated fluid from the underground resource via the producer wells, through the power plants' heat exchange system, and reinjecting the cooled fluid back to the underground resource via the injection wells. The closed-loop surface system would prevent geothermal fluid from exposure to the surface environment. Pipelines may be placed above-ground on conventional pipe stands, or below-ground in prepared trenches.

EDR is also pursuing potential options for burying geothermal fluid pipelines. Burying geothermal fluid pipelines would be expected reduce visual impact and minimize permanent surface disturbance. EDR would pursue all relevant state permitting required prior to installation of such a system.

2.2.5.1. *Geothermal Fluid Volumes and Makeup Water*

Geothermal fluids would be primarily composed of locally sourced groundwater. Water used for drilling, completions, and testing is described in Section 2.2.3.3.

The geothermal fluid system would be designed to be a closed-loop system above ground, limiting or eliminating any evaporative or other surface losses. Expected consumption or loss would occur underground, as the water volume is released through the pores and fractures in the geothermal reservoir, also known as the 'leak-off'. Throughout production, leak-off volumes would be replenished with makeup water sourced from groundwater wells. The UDWRi regulates all groundwater uses for the project and will determine if a non-consumptive appropriation or leased water right is the appropriate mechanism for production water use.

2.2.5.2. *Geothermal Fluid Pipelines: Construction Procedures & Surface Disturbance*

Dedicated maintenance roads adjacent to pipelines for long-term operational use are anticipated to be 10-ft-wide, and either two-track dirt roads or built up with aggregates as-required by the topography. Some sections of pipeline may run adjacent to existing or planned two-lane access roads, which may function as the maintenance road to minimize surface disturbance.

The total surface disturbance associated with the geothermal fluid system within the AOI would be approximately 32 acres. Of the total surface disturbance associated with geothermal fluid system, approximately 12 acres of disturbance are on BLM managed lands. This includes approximately 13,516 linear feet of pipeline placed on BLM lands, with the remaining lengths placed on private property. Surface disturbance associated with pipeline construction assumes approximately 34,747 linear feet with a 40-ft-wide construction corridor for earthmoving and construction equipment. Pipeline corridors are planned to be shared with sub-transmission line corridors to overlap and minimize surface disturbance. A summary of surface disturbance by project component is provided in Section 2.2.11.

Pipe support piles and pipe stands would be required along the length of the proposed pipelines, where above-ground pipelines are constructed. The resulting long-term operational impact from pipe supports is calculated to be a 5-ft-wide corridor of disturbance along the length of the pipeline. Sections of pipeline that are placed below ground would be fully reclaimed at ground surface, except where surface access ports for maintenance are constructed. The remainder of pipeline construction corridors are anticipated to be largely reclaimed following construction, with single-lane, 10-ft-wide maintenance roads left adjacent for long-term operational requirements.

2.2.6. INTERCONNECTION TO ELECTRICAL GRID

A single 362 kV transmission line, a centralized collector switchyard, and a network of up to 69 kV sub-transmission lines are proposed to be constructed to connect the project to the electrical grid. The sub-transmission lines would connect power plant facilities to the well pads and central switchyard. The switchyard would be used to step up the low voltage electrical energy generated at the power plants to the higher voltage required for transmission. An approximately 6-mile, 362 kV transmission line would connect from the central switchyard to the existing Milford substation. A ROW grant would be required for the approximately 2,400-ft portion of the power transmission corridor crossing BLM lands outside the BLM lease area to the Milford Substation. An SF-299 form would be submitted for this ROW.

Transmission and overhead sub-transmission lines would be constructed per APLIC recommendations and/or Avian Protection Plan Guidelines to minimize electrocutions and collisions (**Appendix D**).

2.2.6.1. *Sub-Transmission Line Routing and Switchyard Location*

A network of up to 69 kV sub-transmission lines would be constructed between power plants, well pads, and the central switchyard along corridors; sections of sub-transmission lines would be constructed in multiple phases of development (See section 2.2.6.3). The identified target sub-transmission corridors may be relocated within the AOI as new leasing arrangements are finalized and as the geothermal resource continues to be explored. Relocations within federal property on the AOI would be surveyed to avoid additional impacts to biological or cultural resources and would be subject to BLM sundry notice and approval. Sub-transmission line corridors would consist of a line of galvanized steel monopole or similar structures, supporting one or more overhead 69kV electric lines, with a two-track or similar maintenance road adjacent. Buried sub-transmission lines would be placed in a narrow trench in armored cable or conduit and labeled with visible markings at ground surface. Bried or cable-tray sub-transmission lines would be sited along corridors surveyed to avoid additional impacts to biological or cultural resources and would be placed parallel to access roads or other planned disturbance corridors to avoid increased surface disturbance.

The central switchyard would be constructed on private property. The switchyard pad would measure approximately 850 feet by 515 feet (approximately 10 acres). The central switchyard would be constructed in the preliminary phase of development, along with sections of the sub-transmission lines connecting the switchyard to power plant units 1, 2, and 3 and connecting to the Bearskin, Gold, and Frisco well pads (constructed under previously approved Exploration EA) for ongoing operational power. Additional sections of sub-transmission lines would be constructed in future phases of development.

2.2.6.2. *Transmission Line Routing*

A single 362 kV transmission line approximately 6 miles in length would be constructed in the initial phase of development to connect the central switchyard to the existing Milford Substation along the corridor as shown on **Figure 1-2**. The identified target transmission corridor may be relocated, or

additional corridors designed / constructed; relocations or additions on federal property within the AOI would be surveyed to avoid additional impacts to biological or cultural resources and would be subject to BLM sundry notice and approval. Disturbance on BLM managed lands would be limited to 155 total acres of disturbance. Additional corridors would not increase the surface impacts from geothermal operations proposed in this EA and would be permitted as required by local, state and federal regulation. An approximately 200-ft wide ROW (100-ft on either side of the transmission centerline) would be established along the length of the transmission line. The actual disturbed corridor is anticipated to be approximately 60-ft wide. A ROW grant would be required for the approximately 2,400-ft portion of the power transmission corridor crossing BLM lands outside the BLM lease area to the Milford Substation. An SF-299 form would be submitted for the off-lease portion of the transmission corridor. The 362 kV transmission line structures would be galvanized steel or similar structures.

2.2.6.3. *Sub-Transmission Line, Switchyard, and Transmission System: Construction Procedures and Surface Disturbance*

Site preparation for the switchyard pad would take place as described in Section 2.2.2. Approximately 22,720 linear feet of sub-transmission line (45.0% of the total sub-transmission line length) and 5,100 linear feet of transmission line (16.0% of the total transmission line length) are planned to be placed on BLM managed lands, with the remaining lengths placed on private property. Of the 5,100 linear feet placed on BLM lands, approximately 2,400-ft linear feet would cross BLM managed lands outside the BLM lease area to the Milford Substation.

The total surface disturbance associated with the power sub-transmission line, switchyard, and transmission system within the AOI would be approximately 84 acres (23 acres on BLM):

- 30.39 acres of sub-transmission line disturbance,
- 43.97 acres of transmission line disturbance, and
- 10 acres of switchyard disturbance.

Surface disturbance associated with sub-transmission line construction assumes approximately 50,470 linear feet of sub-transmission line with a 40-ft-wide construction corridor for earthmoving and construction equipment, narrowing to 20-ft-wide where the construction corridor is shared with geothermal fluid pipeline corridors. Approximately 34,700 linear feet of sub-transmission line corridor is planned to be shared sub-transmission and pipeline corridor. Surface disturbance associated with transmission line construction assumes approximately 31,900 linear feet of transmission line with a 60-ft-wide construction corridor for earthmoving and construction equipment. A summary of surface disturbance by project component is provided in Section 2.2.11.

Sub-transmission and transmission construction corridors are anticipated to be largely reclaimed following construction, with single-lane, 10-ft-wide maintenance roads left adjacent to corridors for long-term operational requirements, where necessary. Maintenance roads would be either two-track dirt roads or built up with aggregates as need by the topography. Approximately 34,750 feet of sub-transmission lines (68% of the total length of sub-transmission lines) would be co-located to run adjacent to existing or planned two-lane access roads, which would function as the maintenance road to minimize surface disturbance.

2.2.7. ANCILLARY FACILITIES

EDR would construct a small control building with adjoining workshop and parking lot on private land for long term operations of the power plants and geothermal fluid system. All applicable state and county

permits would be secured prior to construction. The control building and parking lot would be located on a power generation facility pad or laydown yard and would not increase the overall surface disturbance.

Due to commitments by the applicant, any other additions would be located within the up to 631-acre project footprint and would not increase the total surface impacts from geothermal operations proposed in this EA. Additions on private land would be permitted as required by local, state and federal regulation.

2.2.8. ACCESS ROADS

Principal access to the project area is from Utah State Route 257, approximately four miles north of Milford, Utah, via Geothermal Plant Road to North Antelope Point Road to East Salt Cove Road. All roads leading from Utah State Route 257 to the project entrance roads are maintained by Beaver County. The project area is traversed by numerous pre-existing smaller roads and "two-tracks." Beaver County roads would not require upgrades and are currently maintained under a Road Maintenance Agreement between EDR and Beaver County. Some pre-existing roads would also not require upgrade, such as privately-owned two-lane gravel roads. Any unimproved "two-track" roads that are not existing authorized routes would require surface disturbance for improvement. New access roads would require a total of 40 feet width of surface disturbance to accommodate a 24-foot-wide drivable roadbed, plus 8 additional feet on each side to facilitate cut and fill requirements, as well as for placing or burying water, power, or communications lines and for stormwater drainage. New or improved access roads would be constructed using a dozer and/or road grader and would be constructed in a phased approach to allow access to well pads. A summary of access roads construction lengths and disturbances is provided in **Table 2-3**. Target construction locations for access roads are identified on **Figure 1-2**.

Table 2-3. Access Roads Construction Lengths and Disturbances

Access Road Type	Private Surface Road Length (feet)	BLM Surface Road Length (feet)	Total Road Length (Feet)	Total Road Length (miles)	Disturbance (acres)
New Road (on-lease)	23,240	19,220	42,460	8.04	38.99
Existing Roads (built under Exploration EA)	5,440	14,760	20,200	3.83	18.55
Total	**28,660**	**33,980**	**62,660**	**11.87**	**57.54**

Approximately 18 acres (~32%) of the total access road surface disturbance has already been built under the previously approved Exploration EA. These existing access roads would be repurposed for project production use.

Improvements to existing two-track roads have been included as new disturbance in the above acreage of surface disturbance. Where existing roads are unavailable to allow vehicular access along the 362 kV transmission line, a 10-ft-wide two-track dirt road would extend within the existing proposed disturbance corridor (60-ft.) to facilitate maintenance of the transmission line. As the maintenance road would be installed within the existing proposed disturbance corridor, no additional surface disturbance was calculated (maintenance road would encompass approximately 16% of the proposed transmission line corridor). The maintenance road would run parallel to the transmission line; approximately 2,400-ft of the maintenance road would extend off-lease on BLM surface. A ROW grant would be required for any off-lease access roads in the project area. SF-299 forms would be required for application of these rights-of-way.

Constructed access roads crossing existing drainages may require installation of culverts. Culvert installation would follow BLM design criteria and would be constructed pursuant to standards established in the Gold Book (BLM 2007).

Dust abatement in the form of water or other temporary surface treatments would be utilized to control fugitive dust within the project area on access roads or where other ground disturbing activities occur. As required by the Project Design Features (Appendix D. (3.)), any surface treatments other than water would be reviewed by BLM prior to utilization.

2.2.9. AGGREGATE REQUIREMENTS AND SOURCE

Construction of well pads, access roads, power plant pads, foundations, and associated laydown yards, staging areas, transmission lines and associated central switchyard, and the geothermal fluid system would require aggregates and concrete. Aggregate material would be expected to be obtained from a local source, such as the Martin Marietta Milford Quarry, located approximately six miles southwest of the AOI. Concrete would also be obtained from a local source, such as a batch plant in Milford or other plants near the project area.

Table 2-4. Aggregate Sources

Aggregate Source Area	Township, Range, Section		Approximate UTM Coordinates (NAD83)	
			Easting (m)	Northing (m)
Martin Marietta Milford Quarry	T.27S, R.10W.	Sec. 20	324970	4258296

Facility pads, well pads, and access roads were selected to minimize the need for aggregate application, with the majority of the proposed pads consisting of an approximate even mix of cut and fill to make a stable surface (**Appendix A**).

2.2.9.1 Drill Cuttings Re-use

In addition to the aggregate requirements described in 2.2.9, it is proposed that Fervo would also be allowed to use drill cuttings from the reserve pits (2.2.3.1) to utilize in construction of the project. Prior to utilization, each reserve pit that is identified for drill cutting re-use would need to be tested and the results of the report would be submitted to the BLM Geologist for approval of use as required in Appendix D. Project Design Features (5.). Fervo has committed to this design feature in order to reduce total aggregate needs and to reduce the size of well pad reserve pits that contain cuttings and geothermal fluid.

2.2.10. SURFACE RECLAMATION

After the well drilling and testing operations are completed, the liquids from the reserve pits would either naturally percolate, evaporate, or be physically removed to reclaim the reserve pits. The solid contents remaining in each of the reserve pits, typically consisting of non-hazardous, non-toxic drilling fluid and rock cuttings, would be tested in accordance with the Gold Book (BLM 2007), existing state standards, or with project-specific requirements of the drilling and water permitting agencies to confirm that they are not hazardous. As stated in Section 2.2.3.2, fluid additives in high concentrations may be hazardous or toxic, but in the concentrations utilized for well drilling, the solid contents remaining in reserve pits are not expected to be hazardous or toxic. Non-hazardous and non-toxic drilling fluid and cuttings would be buried in the reserve pit, and any drilling fluid and/or cuttings identified as hazardous, or toxic would be disposed of according to Utah Department of Environmental Quality (UDEQ) – Division of Waste Management and Radiation Control (DWMRC) regulations.

If a well is judged by EDR to have no commercial potential, it may continue to be monitored, but would be plugged and abandoned in conformance with the well abandonment requirements of the BLM and UDWRi. Any associated access roads would also be reclaimed in accordance with best management practices identified in the Gold Book (BLM 2007). The portions of the cleared well pads, power plant pads, laydown yards, and other sites not needed for operational and safety purposes (i.e., the "shoulders" of the pad) would be recontoured to a final or intermediate contour that would blend with the surrounding topography. Areas to be reclaimed would be either ripped, tilled, or disked on contour, and reseeded with a BLM-approved seed mix. The stockpiled topsoil would also be spread on the area to aid in revegetation.

When the Cape Geothermal Power Project reaches the end of its operational life, or if at any point the operator is unable to continue facility operations, the facility would be decommissioned. All equipment, structures, and associated infrastructure would be removed by EDR. All wells would be plugged and abandoned in conformance with the well abandonment requirements of the BLM and UDWRi. Disturbed areas would be recontoured to a final contour that would blend with the surrounding topography as much as possible and be reseeded with a BLM-approved seed mix.

2.2.11. SUMMARY OF SURFACE DISTURBANCES

The Proposed Action includes the development of an estimated 320 geothermal production and injection wells, an estimated 23 well pads, up to 20 modular geothermal power plants, a power distribution system, an electrical switchyard, a general tie-in transmission line, geothermal fluid pipeline gathering system, associated access roads, and ancillary facilities. The maximum surface disturbance associated with the project during construction would be 631 acres, approximately 1.8% of the total AOI. Of the proposed surface disturbance, approximately 155 acres (25% of proposed surface disturbance) would be located on BLM administered lands; the remaining 476.24 acres (75% of proposed surface disturbance) would be located on private land (**Table 2-5**). All surface disturbing activities would progress incrementally in phases, with power plants, well pads, and access roads constructed individually or in groups of two or three, rather than all constructed at one time.

Table 2-5. Summary of Proposed Action Surface Disturbance

Project Component	Acreage Disturbed on BLM Lands (%)	Acreage Disturbed on Private Lands (%)	Total Disturbed Acreage
Well Pads	83.04 (53%)	73.69 (47%)	156.73
Power Plants and Laydown Yards	0.00 (0%)	290.08 (100%)	290.08
Geothermal Fluid System	12.41 (39%)	19.5 (61%)	31.91
Transmission Lines and Switchyard	28.42 (34%)	55.97 (66%)	84.39
Access Roads	31.21 (54%)	26.33 (46%)	57.54
Water Impoundments	0.00 (0%)	10.67 (100%)	10.67
Total	**155.08 (25%)**	**476.24 (75%)**	**631.32**

2.2.12. Design Features

Design features are measures or procedures incorporated into the Proposed Action that would reduce or avoid adverse impacts. BLM required stipulations are detailed in leases UTU-95314, UTU-95315, UTU-95318, UTUT-105294998, UTUT-105294999, and UTUT-105295000 in **Appendix D**.

2.3. ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

For an EA where there are no unresolved conflicts concerning alternative uses of available resources, only the Proposed Action requires consideration (BLM 2008). In this EA, no unresolved conflicts with respect to alternative uses have been identified, and only the Proposed Action and No Action Alternative are considered. There were no alternatives identified in internal scoping that would adequately meet the purpose and need of the proposed action.

CHAPTER 3.0. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1. INTRODUCTION

This chapter describes the existing baseline conditions relevant to the issues presented in Section 1.6 and discloses the potential environmental impacts of the Proposed Action and No Action Alternative on those issues. The NEPA Handbook states that issues need to be analyzed in detail if 1) "analysis of the issue is necessary to make a reasoned choice between alternatives," and 2) "the issue is significant (…or where analysis is necessary to determine the significance of impacts)" (BLM 2008). Issues potentially impacted to a level requiring further analysis are described in this chapter.

3.2. GENERAL SETTING

This section is to describe the current situation and setting of the AOI. It includes actions and impacts that are common to all resources and issues. It also includes general presumptions and analysis used. Issues that are analyzed individually in detail begin in section 3.3.

3.2.1. Past and Present Actions

Past and present actions in the analysis areas include renewable energy production facilities (geothermal, solar, and wind), roads and highways, railways, utility lines, livestock grazing, agricultural production, and wildfire. Past and present land-disturbing activities in the analysis areas were initially estimated through acres of land with disturbed or developed SWReGAP land cover classes (Lowry et al. 2005); however, the disturbed or developed land cover classes were underrepresented in the SWReGAP data due to the renewable energy developments within the analysis area since the publication date (2005). As such, the 3rd party contractor, Groundwater & Environmental Services, Inc.(GES) completed an aerial imagery review (ESRI 2024) of the analysis areas to gain a more accurate estimate of past and present land-disturbing activities within the analysis areas. The SWReGAP land cover classes were used in combination with the results from the aerial imagery review to estimate the acreage of past and present land-disturbing activities used for analysis in this EA. SWReGAP provides the following definitions of disturbed or developed land cover classes that are mapped within the analysis areas:

- Recently Mined or Quarried: Areas where open pit mining or quarries are visible in the imagery (images acquired between 1999-2001) and are 5 acres or greater in size.

- Developed, Open Space – Low Intensity: Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces accounts for 0 - 49 percent of total cover.

- Developed, Medium Intensity: Includes areas with a mixture of constructed materials and vegetation. Impervious surface accounts for 50-79 percent of the total cover. These areas most commonly include single-family housing units.

- Developed, High Intensity: Includes highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80 to 100 percent of the total cover.

Disturbed or developed land cover classes within the analysis areas are shown on **Figure 3-1**. A summary of disturbed or developed land cover within the various analysis areas for each resource is provided in

Table 3-1. Past and present actions are discussed in detail in the Affected Environment section for each issue.

Table 3-1. Summary of Past and Present Actions within Analysis Areas for Resources with Issues.

Analysis Area	Analysis Area Acreage	Disturbed or Developed Land Cover Acreage	Analysis Area Disturbed (%)	Acreage Disturbed by Wildfires	Analysis Area Disturbed by Wildfires (%)
Energy Production	631.32	65.08	10.3%	597	94.6%
Cultural Resources (Physical APE)	631.32	65.08	10.3%	597	94.6%
Cultural Resources (Visual APE)	39,208	2,145	5.5%	21,102	53.8%
Soils, Vegetation, Pronghorn	106,182	3,206	3.0%	76,288	71.8%
Migratory Birds	36,583	1,730	4.7%	26,386	72.1%
Kit Fox	94,568	4,026	4.3%	58,389	61.7%

Common to all of the analysis areas, are impacts from wildfires. Approximately 95% of the project area and 83% of the AOI has been disturbed by wildfires. After the 2007 Milford Flat Fire, Emergency Stabilization and Rehabilitation (ESR) actions took place following containment. These actions including aerial seeding, chaining, drill seeding, and greenstripping. Prior to the ESR actions, rangeland improvement projects occurred that included 1994 Milford Bench drill and aerial seeding, and 1960s Cedar Cove chainings. Some of the previous vegetation treatments have occurred within the AOI. Past vegetation treatments in the area of the AOI are summarized in **Table 3-2**. Appropriate buffer would be applied by BLM to protect surface and sub-surface improvements.

Table 3-2. Summary of Past Vegetation Treatments in the Area of the AOI

Treatment Name	Year	Acres
Milford Flat Aerial Seeding (ESR)	2008	64,870
Milford Flat Greenstripping (ESR)	2008	1,704
Milford Flat Mechanical Seeding (ESR)	2008	4,822
Milford Flat Chaining (ESR)	2008	31,115
Milford Bench Fire Drill Seed (ESR)	1994	7,590
Geothermal Fire Aerial Seed (ESR)	1994	392
Black Rock Fire Chaining (ESR)	1980	1,768
Cedar Cove Resource Chaining	1963	540
Bailey Ridge Resource Chaining	1962	1,084
Total Acreage		**113,885**

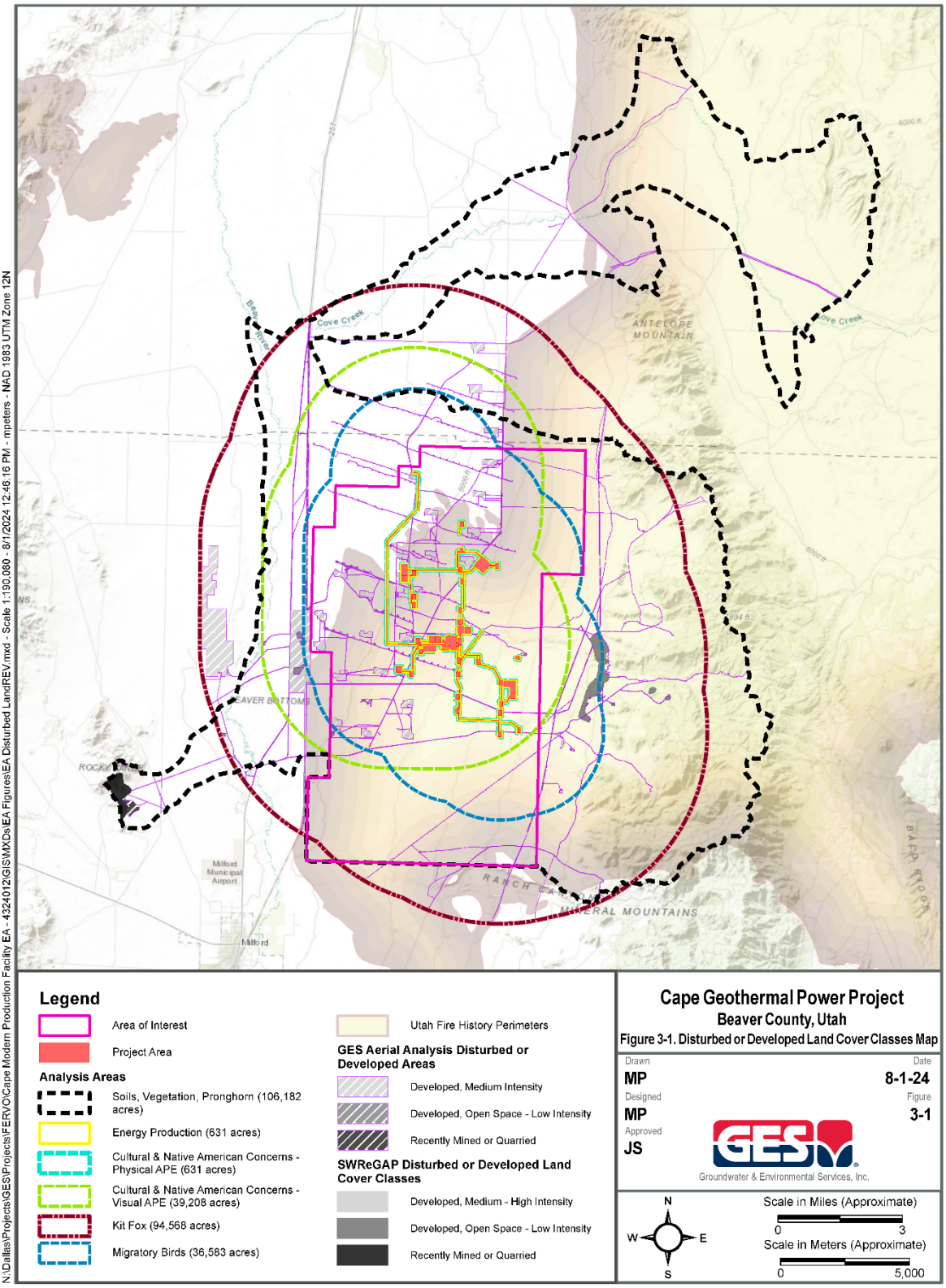

Figure 3-1. Disturbed or Developed Land Cover Classes Map.

3.2.2. Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions (RFFAs) are decisions, funding, or formal proposals that are either existing or highly probable based on known opportunities or trends.

Minerals-related authorizations within the project area are the existing geothermal leases (UTU-95314, UTU-95315, UTU-95318, UTUT-105294998, UTUT-105294999, and UTUT-105295000). There are other geothermal leases within the analysis area including eleven parcels of federal mineral estate (32,527 acres) recently offered by the BLM in the *April 2022 Utah Geothermal Competitive Lease Sale* (BLM Utah State Office 2022); three parcels within the 2022 Lease Sale are within the AOI and are currently leased by EDR (UTUT-105294998, UTUT-105294999, and UTUT-105295000).

Two additional geothermal leases within the 2022 Lease Sale have been approved for geothermal development by the BLM under the Rodatherm Energy Geothermal Pilot Project. If the pilot project indicates a commercially viable geothermal resource, a development well field and generation facility would be proposed in the future. The potential effects from a development well field and generation facility are speculative at this time and unable to be quantified. Those RFFAs with quantifiable surface disturbance impacts based on approved proposals are summarized in **Table 3-3**.

Table 3-3. Quantifiable RFFAs within Analysis Areas

Project	Project ID	Project Status	Surface Disturbance (acres)
Rodatherm Energy Geothermal Pilot Project	DOI-BLM-UT-CO10-2023-0008-EA	Approved	15
Total			**15**

The BLM is not aware of any other additional proposals presently encumbering the project area at this time. The actions below have no formal proposals but are likely to become reasonably foreseeable future actions in the analysis areas based on current land use patterns and trends:

- Geothermal exploration and subsequent development on existing geothermal leases.
- Additional renewable energy generation projects.
- Continued cattle grazing and range improvement projects.

3.3. ISSUE #1. GEOLOGY / MINERAL RESOURCES / ENERGY PRODUCTION: HOW WOULD THE PROPOSED PROJECT AFFECT GEOTHERMAL HEAT IN THE NATURALLY OCCURING RESERVOIR?

3.3.1. Affected Environment

The known mineral resources within the AOI are geothermal resources in the form of hot rock at depth and surficial deposits of common variety sand and gravel. Sand and gravel resources are widespread throughout Beaver County, primarily in Quaternary alluvial deposits (Beaver County 2019).

There are no minerals-related authorizations (leases, mining claims, permits) on the federally managed lands within the AOI other than the proponent's geothermal leases and lands nominated by the proponent for future geothermal leasing. The proposed ROW which is situated on a geothermal lease held by Rodatherm in the SE1/4 of SEC 11, T 26S, R 10W near the Milford substation is currently the only

exception. There are presently no active solid mineral mining activities on the privately-owned lands within the AOI.

The proposed project would extract heat energy from a naturally occurring resource of hot rock. EDR has constructed a geologic temperature model of the Cape geothermal reservoir from its exploratory drilling and the resulting temperature logs, as well as from available well data, geophysical surveys, and average known conductive temperature gradients, allowing accurate prediction of temperature at depth. This geologic temperature model predicts several hundred megawatts or more of electrical energy could potentially be generated long-term from the reservoir using EDR's Enhanced Geothermal System (EGS).

The heat energy to be extracted to generate electricity would be lost to the resource, resulting in a temperature decline in the reservoir rock. The rate at which the temperature would decline is not known at this time. At the posting of this EA document, the Proposed Action is the only known commercial heat recovery action within the AOI. The proposed project footprint, encompassing approximately 631 acres within the AOI, was selected as the analysis area.

Past and Present Surface-Disturbing Activities

As described in section 2.2.2, there are no minerals-related authorizations (leases, mining claims, permits) on the federally managed lands within the AOI other than the proponents geothermal leases and lands nominated by the proponent for future geothermal leasing.

Past and present surface-disturbing activities in the analysis area that have affected surface geology, mineral resources, and energy production include mineral exploration and development, water storage, utility lines, and road construction. Approximately 65 acres within the 631-acre project footprint have already been disturbed through the construction of exploration well pads, access roads, utility lines, and water storage impoundments constructed under the previously approved Exploration EA (BLM 2023). The existing surface disturbance (65 acres) from the previously approved Cape Modern Geothermal Exploration Project represents approximately 10 % of the project footprint (analysis area) that has been impacted by past and present surface disturbing activities.

3.3.2. Environmental Impacts—No Action Alternative

Under the No Action Alternative, there would be no changes to Energy Production in the project area as a result of the Proposed Action; however, because of existing geothermal leases within the AOI, exploration and development within the AOI are RFFAs under lease rights. Therefore, impacts to Energy Production similar to those discussed in Section 3.4.3 would likely result from RFFAs within the analysis area.

3.3.3. Environmental Impacts—Proposed Action

The Proposed Action would result in up to 631 acres of surface disturbance (100% of the energy production analysis area) and up to 2,000 MW of electrical potential energy of proposed extraction from the geothermal heat resource. The disturbed acreage would be unavailable for future mineral exploration, mining operations, or other energy production projects. Aggregate material would not be recovered on-lease but would be acquired from an existing local supplier and transported to the project area (**Appendix D**). The attainment of aggregate from an offsite supplier (Section 2.2.9) would eliminate the need for additional surface disturbance on-lease.

The Proposed Action would result in thermal energy being extracted from the resource. The majority of the thermal energy originally in place is contained in the solid rock formation that hosts the geothermal resource. As fluid travels from an injection well to a production well through pores and fractures in the rock formation, the fluid absorbs thermal energy from the rock. The thermal energy would be carried from the

subsurface resource to the surface via the production wells where it would be used to generate electricity or used directly for heating. After the useful amount of thermal energy is extracted from the fluid stream, the cooled fluid would be reinjected into the formation to repeat the energy recovery cycle. This thermal energy extraction results in a gradual cooling of the rock formation over time. Temperature models demonstrate that the zone of cooling is highly localized to the regions in between the injection and production wellbores. During commercial operations, thermal energy is extracted from these regions over time, gradually cooling these regions of the formation over a period of years or decades. Over a period of several centuries, the temperature within these affected regions of the rock formation would recover due to the natural heat flow that occurs in the earth's crust. The total amount of thermal energy extracted from the formation is expected to be equivalent to the amount of energy required to generate up to 2,000 MW or more per year of electric power over the useful life of the project, which is anticipated to be several decades.

Cumulative Impacts

At present, the Proposed Action is the only commercial geothermal heat recovery action within the AOI. The nearest geothermal heat recovery operations near the AOI are PacifiCorp's Blundell Power Plant. The Blundell Power Plant utilizes heat energy (total current extraction ~32 MW electric total) from conventional geothermal brine production from the Roosevelt geothermal field, which is roughly two miles to the east of the AOI. The geothermal energy heating the geothermal brine is ultimately sourced from the same geologic formation that the proponent would be utilizing. The cumulative impacts of the Proposed Action include approximately 631 acres of surface disturbance and up to 2,000 MW of electrical potential energy or more of proposed extraction from the geothermal heat resource.

The geologic temperature model predicts that the Cape reservoir carries sufficient heat capacity to allow generation of electricity for decades. Geothermal commercial viability would be extended by drilling additional infill wells into new underground zones as heat near geothermal fluid flow is extracted, as well as by leveraging new well drilling and completion methods as the project is developed. Potential methods under evaluation include longer wells, well designs to allow for higher flow rates, and/or deeper wells, all capable of extending the commercial life of the project. It is estimated in the geothermal model that several decades of extraction could occur before heat loss renders the field unusable for commercial power generation. Heat within the affected regions of the geothermal reservoir would naturally recharge over an extended time scale and would endure as a heat resource beyond its immediate commercial power viability; the length of time needed for this rejuvenation is anticipated to be measured in centuries. The geothermal production area would be confined by lease or unit setbacks required under UDWRi regulations (R655-1-2.4.4). The BMPs and design features included in **Appendix D** would limit long-term cumulative impacts to the heat energy from the naturally occurring reservoir by balancing flow rates against rates of extraction to ensure sustainable and economic energy recovery rates. Despite the design features to minimize heat loss in the reservoir, some heat loss would occur.

In addition to the quantifiable RFFAs, the BLM recently offered a competitive geothermal lease sale for 11 parcels in Beaver and Millard Counties, totaling approximately 32,527 acres (BLM 2022). Approximately 26 acres of the energy production analysis area (4.2%) was included in the geothermal lease sale. Exploration and development on future leases would cause additional impacts to the heat resource; however, with the exception of the 15 acres of surface disturbance proposed from the recently approved Rodatherm Geothermal Pilot Project, these impacts are not quantifiable at the leasing sale stage of the process because no specific projects have been proposed.

3.4. ISSUE #2. SOILS: HOW WOULD THE PROPOSED PROJECT AFFECT SOILS, INCLUDING POTENTIAL LOSS OF SOIL THROUGH REMOVAL AND EROSION, AS WELL AS COMPACTION?

3.4.1. Affected Environment

The project area is located within the Beaver River: Antelope Spring – Cove Creek, Beaver Bottoms - Beaver River, Negro Mag Wash, and Wild Horse Canyon subwatersheds within the larger Beaver Bottoms-Upper Beaver Watershed (HUC 16030007). The AOI extends into two additional subwatersheds, Milford Municipal Airport – Beaver River and Corral Canyon. The Antelope Spring – Cove Creek, Beaver Bottoms - Beaver River, Negro Mag Wash, and Wild Horse Canyon subwatersheds and the portions of the Milford Municipal Airport – Beaver River and Corral Canyon subwatersheds within the AOI (106,182 acres) were selected as the analysis area for soils as it provides a clear topographic boundary against which to measure impacts to soils. The subwatersheds are shown on **Figure 3-2a**.

Soils within the project area described in the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS) were reviewed to characterize the project area soils. Eleven soil units are mapped within the project area and are summarized below (**Table 3-9**). The USDA Soils Map is provided as **Figure 3-2a and 3-2b**. An erosion hazard rating of "slight" indicates that little or no erosion is likely; "moderate" indicates that some erosion is likely, that unpaved roads or trails may require occasional maintenance; and that simple erosion-control measures are needed; and "severe" indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed (NRCS Soil Survey Staff 2024).

Table 3-4. Project Area Soil Types

Map Unit Symbol	Map Unit Name	Component	Landform	Parent Material	Natural Drainage Class	Runoff Potential	Hazard of Erosion
106	Dixie-Garbo complex, 3 to 8 percent slopes	Dixie	Fan remnants, semi-bolsons	Alluvium derived from igneous and sedimentary rock	Well drained	Medium	Slight (off-road/trail) to moderate (on-road/trail)
		Garbo	Inset fans, semi-bolsons	Alluvium derived from igneous and sedimentary rock	Well drained	Medium	Slight (off-road/trail) to moderate (on-road/trail)
112	Heist-Crestline, strongly alkaline, complex, 0 to 3 percent slopes	Heist	Fan skirts, semi-bolsons	Alluvium derived from igneous and sedimentary rock	Well drained	Very low	Slight
		Crestline, strongly alkaline	On fan skirts, semi-bolsons	Alluvium derived from igneous and sedimentary rock	Well drained	Very low	Slight
116	Hiko Peak-Crestline complex, 3 to 8 percent slopes	Hiko Peak	Fan remnants and semi-bolsons	Alluvium derived from igneous and sedimentary rock	Well drained	Low	Slight (off-road/trail) to moderate (on-road/trail)
		Crestline	Fan skirts, semi-bolsons	Alluvium derived from igneous and sedimentary rock	Well drained	Low	Slight (off-road/trail) to moderate (on-road/trail)
127	Robozo silt loam, 0 to 2 percent slopes	Robozo	Remnants lake terraces, semi-bolsons	Lake Bonneville lacustrine deposits derived from igneous and sedimentary rock	Well drained	High	Slight

Map Unit Symbol	Map Unit Name	Component	Landform	Parent Material	Natural Drainage Class	Runoff Potential	Hazard of Erosion
137	Escalante sandy loam, 3 to 15 percent slopes	Escalante	Escarpments on inset fans, escarpments on stream terraces, and semi-bolsons	Alluvium derived from igneous and sedimentary rock	Well drained	Low	Slight (off-road/trail) to moderate (on-road/trail)
139	Thermosprings-Taylorsflat, moderately saline-Kunzler complex 0 to 2 percent slopes	Thermosprings	Lake plains, semi-bolsons	Alluvium derived from igneous and sedimentary rock and/or mixed lacustrine deposits	Well drained	Low	Slight
		Taylorsflat, moderately saline	Remnant stream terraces, semi-bolsons	Alluvium derived from igneous and sedimentary rock	Well drained	Low	Slight
		Kunzler	Remnant stream terraces, semi-bolsons	Alluvium derived from igneous and sedimentary rock	Somewhat excessively drained	Low	Slight
152	Drum-Taylorsflat, moderately saline association	Drum	Remnant basin floors, semi-bolsons	Alluvium derived from granite over Lake Bonneville lacustrine deposits	Well drained	Medium	Slight
		Taylorsflat	Remnant basin floors, alluvial flats, semi-bolsons	Mixed alluvium and/or mixed lacustrine deposits	Well drained	Low	Slight
208	Blackett-Blue Star association, 3 to 20 percent slopes	Blackett	Fan remnants, semi-bolsons	Alluvium derived igneous rock	Well drained	Medium	Moderate (off-road/trail) to severe (on-road/trail)
		Blue Star	Ridges on fan remnants, semi-bolsons	Alluvium derived from acid and intermediate igneous rock	Well drained	Low	Slight (off-road/trail) to moderate (on-road/trail)
BLE	Blackett-Blue Star association, 3 to 20 percent slopes	Blackett	Alluvial fans	Alluvium derived from acid and intermediate igneous rock	Well drained	Medium	Moderate (off-road/trail) to severe (on-road/trail)
		Blue Star	Ridges on fan remnants	Alluvium derived from acid and intermediate igneous rock	Well drained	Low	Slight (off-road/trail) to moderate (on-road/trail)
ESD2	Escalante-Hiko Peak complex, 2 to 10 percent slopes, eroded	Escalante	Alluvial fans	Alluvium derived from igneous and sedimentary rock	Well drained	Low	Slight (off-road/trail) to moderate (on-road/trail)
		Hiko Peak	Ridges	Alluvium derived from igneous and sedimentary rock	Well drained	Medium	Slight (off-road/trail) to moderate (on-road/trail)
HHD	Haybourne coarse sandy loam, 1 to 10 percent slopes	Haybourne	Alluvial fans	Alluvium derived from granite	Well drained	Medium	Slight (off-road/trail) to moderate (on-road/trail)

In general, soils within the project area range from very fine sands and silty sands to sandy loams. Soil erosion potential in the project area is generally moderate and varies based on soil type, slope, and off-road/trail versus on-road/trail conditions.

Past and Present Surface-Disturbing Activities

Past and present land-disturbing activities in the soil condition analysis area were estimated through acres of land with disturbed or developed SWReGAP land cover classes (Lowry et al. 2005) in combination with the results from the aerial imagery review (ESRI 2024). Disturbed or developed land cover classes within the soil analysis area are shown on **Figure 3-1**. Disturbed or developed land cover classes indicate impacts to soils from sources related to human activity. Approximately 3,206 acres (3.0%) of the soil analysis area appears to have been impacted by past and present surface disturbing activities. Impacts to soils from these land-disturbing activities include increased erosion, loss of soil structure, compaction, and loss of topsoil / topsoil degradation.

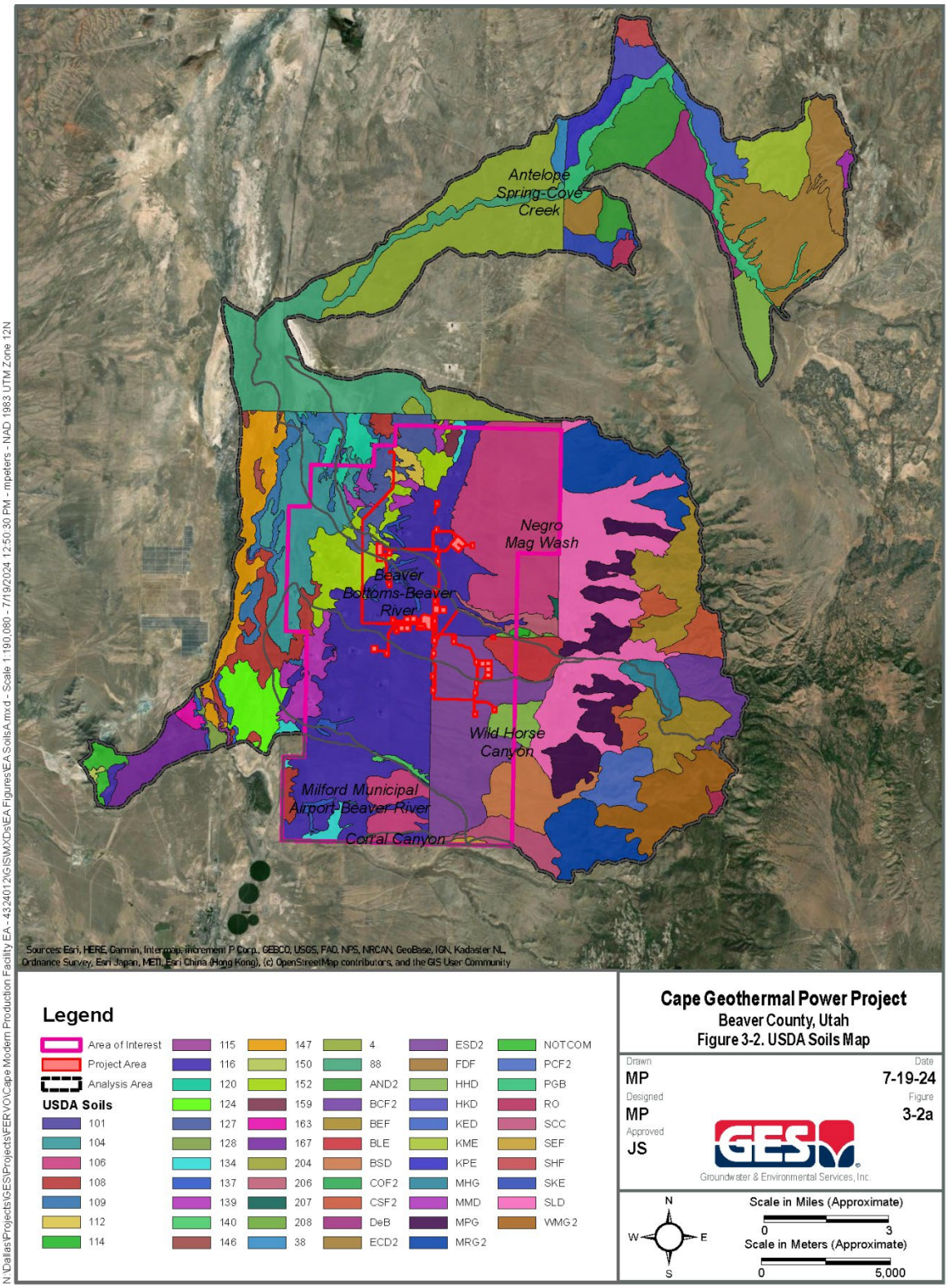

Figure 3-2a. USDA Soils Map (Analysis Area).

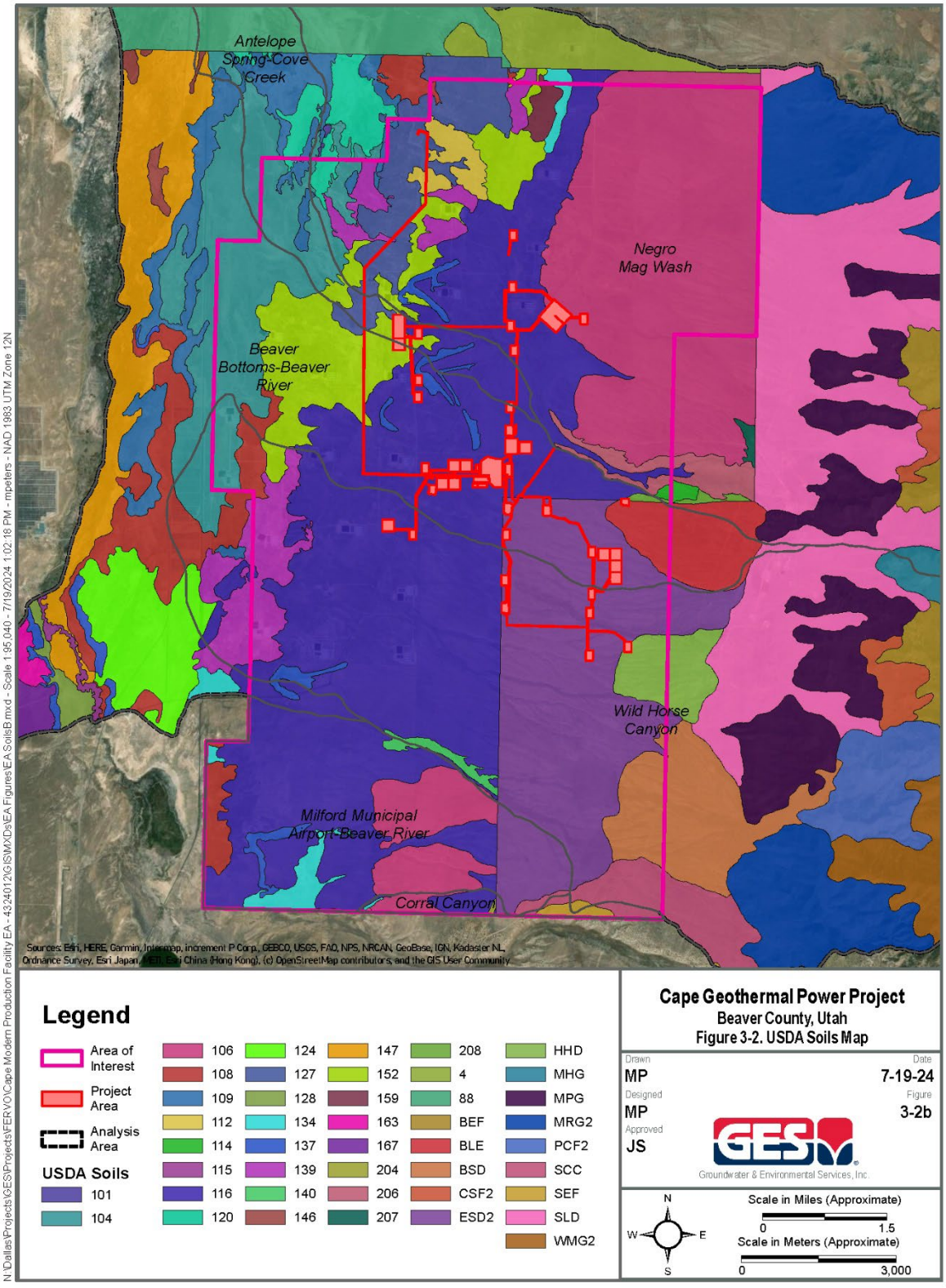

Figure 3-2b. USDA Soils Map (Project Area).

3.4.2. Environmental Impacts—No Action Alternative

Under the No Action Alternative, there would be no changes to the soil on federal land in the project area as a result of the Proposed Action; however, because of existing geothermal leases within the AOI, exploration and development within the AOI are RFFAs under lease rights. Therefore, impacts to soil similar to those discussed in Section 3.4.3 would likely result from RFFAs within the analysis area. If the Proposed Action is not selected, impacts to soil from present land uses within the project area would still persist. Present land uses impacting soil include geothermal exploration, water storage, road use, and livestock grazing. Impacts to soil from these land uses would include increased erosion, loss of soil structure, compaction, and topsoil degradation.

3.4.3. Environmental Impacts—Proposed Action

The Proposed Action would result in up to 631 acres of surface disturbance (approximately 0.6% of the soil analysis area). Soil erosion potential in the project area is generally moderate and varies based on soil type, slope, and off-road/trail versus on-road/trail conditions. Approximately 99% of the proposed surface disturbance would occur in areas with shallow slopes of 0% to 15% with slight to moderate erosion potential (89% of project area). Expected impacts to specific soil types are described in **Table 3-10**.

Table 3-5. Project Surface Disturbance by Soil Type

Map Unit Symbol	Map Unit Name	Soil Type in Project Area Disturbed (acres)	Soil Type in Analysis Area (acres [%])	Soil Type in Analysis Area Disturbed (%)
106	Dixie-Garbo complex, 3 to 8 percent slopes	36.2	7,732 (7.3%)	0.5%
112	Heist-Crestline, strongly alkaline, complex, 0 to 3 percent slopes	2.3	295 (<0.3%)	0.8%
116	Hiko Peak- Crestline complex, 3 to 8 percent slopes	354.3	13,564 (12.8%)	2.6%
127	Robozo silt loam, 0 to 2 percent slopes	19.2	1,456 (1.4%)	1.3%
137	Escalante sandy loam, 3 to 15 percent slopes	2.3	623 (0.6%)	0.4%
139	Thermosprings-Taylorsflat, moderately saline-Kunzler complex 0 to 2 percent slopes	0.6	1,515 (1.4%)	0.04%
152	Drum-Taylorsflat, moderately saline association	48.1	2,195 (2.1%)	2.2%
208	Blackett-Blue Star association, 3 to 20 percent slopes	1.3	64 (<0.1%)	2%
BLE	Blackett-Blue Star association, 3 to 20	3.3	962 (0.9%)	0.3%
ESD2	Escalante-Hiko Peak complex, 2 to 10 percent slopes, eroded	158.8	5,208 (4.9%)	3%
HHD	Haybourne coarse sandy loam, 1 to 10 percent slopes	4.4	1,673 (1.6%)	0.3%

Land disturbing activities within the project area would result in increased erosion, loss of soil structure, compaction, and loss of topsoil / topsoil degradation. Use of equipment would compact soils, which would

reduce soil infiltration rates, leading to increases in overland flow of water, erosion, and displacement of soil (BLM 2016). These impacts would be primarily localized to construction areas and access roads. The referenced impacts to soils would extend slightly beyond the project footprint due to increased soil instability and increased potential for wind and water erosion in the vicinity of surface disturbing activities (compacted and graded areas, areas of vegetation removal).

The increased erosion and sedimentation would be greatest in the short term immediately after construction when disturbed soils are loose but would decline over time in areas where reclamation is implemented and in other areas as natural stabilization occurs (BLM 2016). During project activities, the disturbance corridor would be maintained to preserve the natural runoff regime and prevent excessive erosion. Increased stormwater runoff, sedimentation, and soil compaction during pad and road construction would be mitigated through the implementation of best management practices (BMPs) and design features included in **Appendix D**. Erosion mitigation measures would include drainage bars, check dams, and berms. Disturbed areas that are no longer being used would begin the reclamation process immediately, and the final reclamation of the project area following project completion would help to reduce long-term loss of soil and soil degradation.

Construction for the exploration activities associated with proposed project has been authorized by the UDWQ under UPDES Permit Number UTRC08093. The SWPPP was approved by UDWQ and has been implemented for the existing exploration activities (GES 2023). The SWPPP includes measures designed to prevent excess sediment from discharging to surface waters in the analysis area. A SWPPP amendment or an additional SWPPP would be prepared, and NOI submitted to obtain authorization from UDWQ for stormwater discharges associated with the proposed production project.

Cumulative Impacts

The Proposed Action would add incrementally to the acreage of soil impacts from past and present surface-disturbing activities (3,206 acres) and quantifiable RFFAs (15 acres, **Table 3-3**) in the analysis area. The cumulative impacts from geothermal energy exploration and development on soil compaction and erosion would be considered minor when combined with other projects and land uses in the analysis area (USFS and BLM 2008); however, the loosening of earthen material and the removal of soil and vegetation would contribute to sediment and total dissolved solids (TDS) to the watershed (BLM 2016). The approximately 631 acres of disturbance from the Proposed Action would represent a 19.7% increase to the approximately 3,206 acres of past and present surface disturbance to soils in the analysis area (**Figure 3-1**). Including the quantifiable RFFAs within the analysis area, this proposed increase of surface disturbance would result in a cumulative 3.6% of disturbance within the soil analysis area. Salvaged topsoil (and cleared organic material, if saved) from the initial disturbance would be used during the subsequent reclamation. Cumulative impacts to soils from these land-disturbing activities include increased erosion, loss of soil structure, compaction, loss of topsoil / topsoil degradation, loss of soil productivity, and increased sedimentation within the watershed.

In addition to the quantifiable RFFAs, the BLM recently offered a competitive geothermal lease sale for 11 parcels in Beaver and Millard Counties, totaling approximately 32,527 acres (BLM 2022). Approximately 13,824 acres of the soil analysis area (13.0%) was included in the geothermal lease sale. Exploration and development on future leases would cause additional impacts to soils; however, with the exception of the 15 acres of surface disturbance proposed from the recently approved Rodatherm Geothermal Pilot Project, these impacts are not quantifiable at the leasing sale stage of the process because no specific projects have been proposed. The BMPs and design features included in **Appendix D** would limit long-term, incremental cumulative impacts to soils by reducing soil erosion and excess sedimentation within the watershed. The use of salvaged topsoil during reclamation would reduce long-term loss of topsoil / topsoil degradation and would aid in vegetation reestablishment.

3.5. ISSUE #3. VEGETATION: HOW WOULD SURFACE DISTURBANCE FROM CONSTRUCTION OF THE PROPOSED PROJECT AFFECT VEGETATION WITHIN THE ANALYSIS AREA?

3.5.1. Affected Environment

The Antelope Spring – Cove Creek, Beaver Bottoms - Beaver River, Negro Mag Wash, and Wild Horse Canyon subwatersheds and the portions of the Milford Municipal Airport – Beaver River and Corral Canyon subwatersheds within the AOI (106,182 acres) were selected as the analysis area for vegetation as it provides a clear topographic boundary against which to measure impacts to vegetation. The subwatersheds are shown on **Figure 3-3a**. Vegetation in the analysis area was determined by reviewing existing ecoregion and land cover designations (EPA Level IV Ecoregions and SWReGAP land cover classes) and the vegetation communities observed during the field assessment. The AOI is located within the Sagebrush Basins and Slopes and the Shadscale-Dominated Saline Basins Level IV Ecoregions (USEPA 2011). The Sagebrush Basins and Slopes ecoregion (Ecoregion 13c) is semiarid and is typically dominated by Wyoming big sagebrush with perennial bunchgrasses occurring as available moisture increases. The Shadscale-Dominated Saline Basins ecoregion (Ecoregion 13b) is arid and is dominated by shadscale, winterfat, and greasewood and is distinct from the Wyoming big sagebrush of the less saline Ecoregion 13c (EPA 2011). The major land use of the region is cattle grazing. According to the SWReGAP land cover data (Lowry et al. 2005), there is approximately 105,610 acres of vegetation within the 106,182-acre analysis area (99.5% vegetated); however, as discussed in Section 3.2.1, the disturbed or developed land cover classes are underrepresented in the SWReGAP data due to the renewable energy developments within the analysis area since the publication date (2005). As such, GES completed an aerial imagery review (ESRI 2024) of the analysis areas to gain a more accurate estimate of past and present land-disturbing activities within the analysis area. The SWReGAP land cover classes were used in combination with the results from the aerial imagery review to estimate the acreage of each land cover type within the analysis area (**Figure 3-3a**). Based on the aerial imagery review (ESRI 2024) and the SWReGAP land cover data (Lowry et al. 2005), there is approximately 102,976 acres of vegetation within the 106,182-acre analysis area (97.0% vegetated). Inter-Mountain Basins Mixed Salt Desert Scrub was the most abundant land cover type in the project area and Inter-Mountain Basins Big Sagebrush Shrubland was the most abundant in the analysis area. **Table 3-11** lists the acreages of vegetation by SWReGAP land cover type that the Proposed Action would impact through surface-disturbing activities (**Figure 3-3b**).

Table 3-6. Acres of Land Cover Type Affected by Project Surface Disturbance

Land Cover Type	Cover Type in Project Area Disturbed (acres)	Cover Type in Analysis Area (acres)	Cover Type in Analysis Area Disturbed (%)
Agriculture	0	4	0.0%
Colorado Plateau Mixed Low Sagebrush Shrubland	0	3	0.0%
Colorado Plateau Pinyon-Juniper Woodland	15	22,805	0.07%
Great Basin Pinyon Juniper Woodland	0	22	0.0%
Great Basin Xeric Mixed Sagebrush Shrubland	7	2,108	0.3%
Inter-Mountain Basins Big Sagebrush Shrubland	185	35,276	0.6%
Inter-Mountain Basins Cliff and Canyon	0	157	0.0%

Land Cover Type	Cover Type in Project Area Disturbed (acres)	Cover Type in Analysis Area (acres)	Cover Type in Analysis Area Disturbed (%)
Inter-Mountain Basins Greasewood Flat	1	9,806	0.01%
Inter-Mountain Basins Mixed Salt Desert Scrub	190	11,928	1.6%
Inter-Mountain Basins Montane Sagebrush Steppe	0	302	0.0%
Inter-Mountain Basins Mountain Mahogany Woodland and Shrubland	0	344	0.0%
Inter-Mountain Basins Playa	0	252	0.0%
Inter-Mountain Basins Semi-Desert Grassland	16	14,18	1.1%
Inter-Mountain Basins Semi-Desert Shrub Steppe	126	12,683	1.0%
Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex	0	43	0.0%
Invasive Annual and Biennial Forbland	6	380	1.6%
Invasive Annual Grassland	43	1,747	2.5%
Invasive Perennial Grassland	35	1,330	2.7%
Rocky Mountain Aspen Forest and Woodland	0	14	0.0%
Rocky Mountain Cliff and Canyon	0	515	0.0%
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	0	1,207	0.0%
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	0	19	0.0%
Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland	0	205	0.0%
Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland	0	112	0.0%
Rocky Mountain Ponderosa Pine Woodland	0	10	0.0%
Rocky Mountain Subalpine Dry-mesic Spruce-Fir Forest and Woodland	0	17	0.0%
Rocky Mountain Subalpine Mesic Meadow	0	1	0.0%
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	0	8	0.0%

Land Cover Type	Cover Type in Project Area Disturbed (acres)	Cover Type in Analysis Area (acres)	Cover Type in Analysis Area Disturbed (%)
Southern Rocky Mountain Montane-Subalpine Grassland	0	289	0.0%

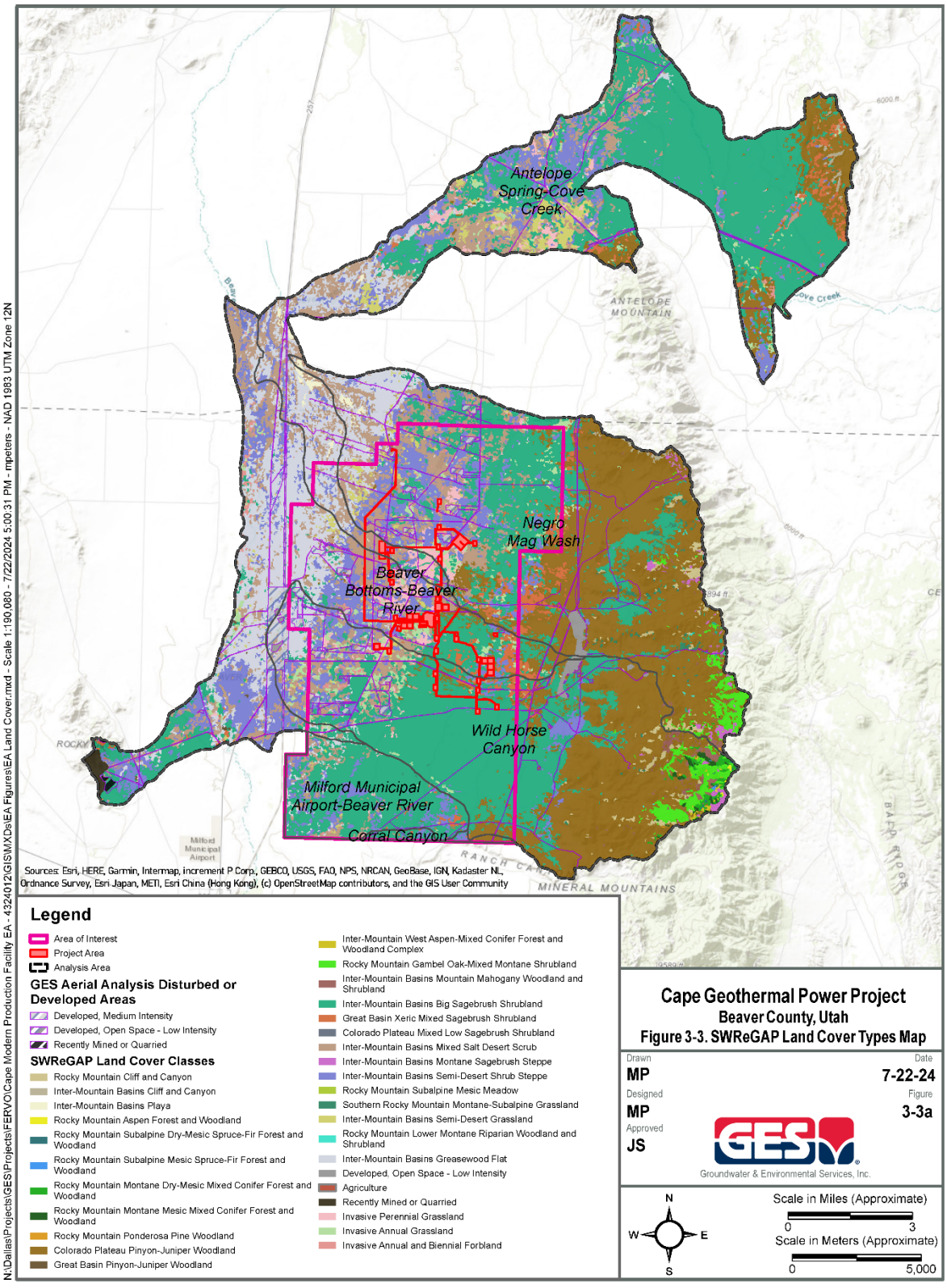

Figure 3-3a. SWReGAP Land Cover Types Map (Analysis Area).

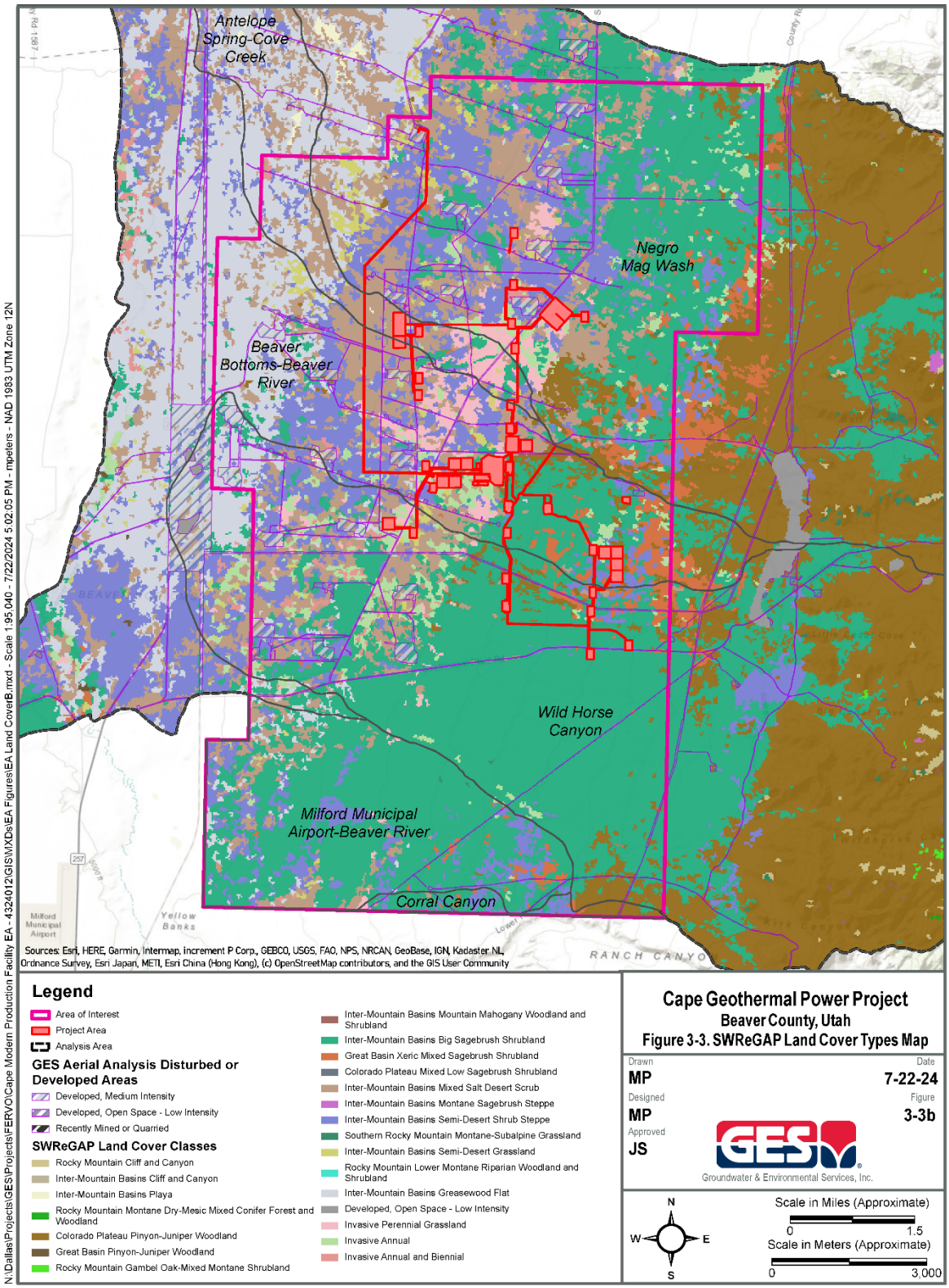

Figure 3-3b. SWReGAP Land Cover Types Map (Project Area).

Based on the field assessment, the project area is primarily dominated by salt desert grasslands and shrublands.

- Black greasewood (*Sarcobatus vermiculatus*),
- crested wheatgrass (*Agropyron cristatum*),
- curveseed butterwort (*Ceratocephala testiculata*),
- forage kochia (*Bassia prostrata*),
- Indian rice grass (*Eriocoma hymenoides*),
- prickly Russian thistle (*Salsola tragus*),
- redstem stork's bill (*Erodium cicutarium*),
- saltbush sp. (*Atriplex* sp.),
- yellow rabbitbrush (*Chrysothamnus viscidiflorus*)

These are the dominant vegetation species throughout the majority of the project area. Scattered patches of shrubland dominated by big sagebrush (*Artemisia tridentata*) are also located within the project area, primarily in the northwestern portion. An isolated stock pond dominated by broadleaf cattail (*Typha latifolia*) is also located in the northwestern portion of the project area.

Other species present include:

- bud sagebrush (*Artemisia spinescens*),
- cheatgrass (*Bromus tectorum*),
- clasping pepperweed (*Lepidium perfoliatum*),
- crossflower (*Chorispora tenella*),
- desert needlegrass (*Pappostipa speciosa*),
- freckled milkvetch (*Astragalus lentiginosus*),
- gooseberryleaf globemallow (*Sphaeralcea grossulariifolia*),
- grey-cushioned grimmia (*Grimmia pulvinata*),
- jointfir sp. (*Ephedra* sp.),
- evening primrose sp. (*Oenothera* sp.),
- plains prickly pear (*Opuntia polyacantha*),
- rubber rabbitbrush (*Ericameria nauseosa*),
- tall tumblemustard (*Sisymbrium altissimum*),
- western tansymustard (*Descurainia pinnata*), and winterfat (*Krascheninnikovia lanata*)

The above species are present within the project area; however, they are widely scattered.

The project area and the majority of the analysis area are also located within UDWR Wildlife Management Unit #22 – Beaver. Within this Wildlife Management Unit, the closest study to the project area is Big Cedar Cove Study (Study No. 22-12). The Big Cedar Cove Study (UDWR 2018b) was reviewed to characterize vegetation trends in the analysis area over the past decades. The study was initiated in 1985 with vegetation sampled in 1985, 1991, 1998, 2003, 2008, 2013, and 2018. The last major disturbance in the area was the Milford Flat wildfire in 2007. Rehabilitation efforts following the wildfire included aerial seeding with a mixture of grasses and forbs, including big sagebrush. Following the Milford Flat Fire, vegetation within the area transitioned from Wyoming Big Sagebrush to Annual-Perennial Grass, with cheatgrass persisting as a co-dominant species (UDWR 2018b). With the exception of a few patches of newly establishing sagebrush habitat, sagebrush observations within the project area were low with individuals observed less than 1-foot in height and generally isolated to a few individuals within a 1,000 square foot (sqft) area. The lack of sagebrush could also be attributed to the presence of invasive annuals including cheatgrass and Russian thistle, which would impede native grasses, forbs, and shrubs from establishing. These invasives have also been attributed to more frequent and intense wildfires (Brooks et al, 2004).

Past and Present Surface-Disturbing Activities

Past and present land-disturbing activities in the vegetation analysis area were estimated through acres of land with disturbed or developed SWReGAP land cover classes (Lowry et al. 2005) in combination with the results from the aerial imagery review (ESRI 2024). Disturbed or developed land cover classes within the vegetation analysis area are shown on **Figure 3-1**. Disturbed or developed land cover classes indicate impacts to vegetation from sources related to human activity. Approximately 3,206 acres (30%) of the vegetation analysis area appears to have been impacted by past and present surface disturbing activities and approximately 76,288 acres (71.8%) has been disturbed by wildfires (**Table 3-1**). Impacts to vegetation from these land-disturbing activities include vegetation loss, plant community fragmentation, and introduction of invasive species. Indirect impacts to vegetation would also result from the changes to soil from land-disturbing activities, primarily the loss of topsoil and soil degradation. These impacts would include increased dust deposition on vegetation, decreased plant production, and decreased species diversity.

3.5.2. Environmental Impacts—No Action Alternative

Under the No Action Alternative, there would be no changes to vegetation on federal land within the project area as a result of the Proposed Action; however, because of existing geothermal leases within the AOI, exploration and development within the AOI are RFFAs under lease rights. Impacts to vegetation similar to those discussed in Section 3.7.3 would likely result from RFFAs within the analysis area. If the Proposed Action is not selected, impacts to vegetation from present land uses within the project area would still persist. Present land uses impacting vegetation include geothermal exploration, water storage, road use, and livestock grazing. Impacts to vegetation from these land uses would include increased dust deposition on vegetation, decreased plant production, introduction of invasive species, and decreased species diversity.

3.5.3. Environmental Impacts—Proposed Action

The Proposed Action would result in up to 631 acres of surface disturbance (approximately 0.6% of the vegetation analysis area) and impacts to vegetation. Impacted vegetation types according to the SWReGAP land cover classes include:

- Colorado Plateau Pinyon-Juniper Woodland
- Great Basin Xeric Mixed Sagebrush Shrubland
- Inter-Mountain Basins Big Sagebrush Shrubland
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Semi-Desert Grassland
- Inter-Mountain Basins Semi-Desert Shrub
- Invasive Annual and Biennial Forbland
- Invasive Annual Grassland
- Invasive Perennial Grassland

As depicted in **Table 3-11**, impacts to these vegetation types represent a loss of 0.0% – 2.7% of the available land cover type in the analysis area. As discussed in Section 3.4.1, following the Milford Flat wildfire in 2007, the project area transitioned from a Wyoming Big Sagebrush to an Annual-Perennial Grass cover type. This is reflected in the highest two percentages of cover type impacted in the analysis area, according to SWReGAP: Invasive Perennial Grassland (at 2.7%) and Invasive Annual Grassland (at 2.5%). The SWReGAP database also noted 15 acres of Colorado Plateau Pinyon-Juniper Woodland would be disturbed; however, no pinyon pine or juniper species were observed within the project area during the field assessment. Dominant vegetation observed during the field assessment included mostly invasive annuals

including cheatgrass and Russian thistle and invasive forbs including redstem stork's bill and curveseed butterwort.

If noxious weeds are discovered within the project area, these areas would be avoided, where possible, to limit their spread, or the infested area would be treated by a licensed applicator using a BLM-approved and livestock-safe herbicide. Treatments on federal surface would be reported to the BLM's noxious weed coordinator. Scotch thistle (*Onopordum acanthium* L.) and Russian thistle are the primary noxious weed concerns in the project area. Disturbed areas no longer in use would be reclaimed utilizing a BLM-approved seed mix. The BLM seed mix would be a weed-free mixture of grasses and forbs. The design features in **Appendix D** would help reduce potential impacts to vegetation by reducing invasive species introduction and reestablishing vegetative cover utilizing a BLM-approved seed mix. Due to the time it would take for vegetation to fully reestablish, complete reclamation of disturbed areas would take several years.

Cumulative Impacts

The Proposed Action would add incrementally to the acreage of vegetation impacts from past and present surface-disturbing activities (3,206 acres) and quantifiable RFFAs (15 acres, **Table 3-3**) in the analysis area. The approximately 631 acres of surface disturbance from the Proposed Action would represent a 19.7% increase to the approximately 3,206 acres of past and present surface disturbance to vegetation in the analysis area (**Figure 3-1**). Including the quantifiable RFFAs within the analysis area, this proposed increase of surface disturbance would result in a cumulative 3.6% of disturbance within the vegetation analysis area. The main concern would be the potential for non-native and invasive species to colonize and dominate sites, and the long-term conversion of habitat types, such as from sagebrush to grassland (USFS and BLM 2008). EDR is contributing to a shrub enhancement project, in coordination with UDWR, to reduce potential impacts to big game species within the project area (**Appendix D**). This project is anticipated to reduce long-term impacts to shrub habitat types, including sagebrush, within the analysis area.

As the project area is primarily dominated by non-native species, and reclamation would utilize a BLM-approved seed mix, final reclamation of the project area would result in an improved vegetative condition relative to the pre-construction baseline should reclamation occur and fully establish. Complete reclamation of disturbed areas would take several years to occur; therefore, the vegetation would remain in a disturbed state until reclamation is complete.

In addition to the quantifiable RFFAs, the BLM recently offered a competitive geothermal lease sale for 11 parcels in Beaver and Millard Counties, totaling approximately 32,527 acres (BLM 2022). Approximately 13,824 acres of the vegetation analysis area (13.0%) was included in the geothermal lease sale. Exploration and development on future leases could cause additional impacts to soils; however, with the exception of the 15 acres of surface disturbance proposed from the recently approved Rodatherm Geothermal Pilot Project, these impacts are not quantifiable at the leasing sale stage of the process because no specific projects have been proposed. The design features included in **Appendix D** as well as the incremental construction and interim and final reclamation of the proposed project would help reduce long-term negative impacts to vegetation.

3.6. ISSUE #4. WILDLIFE AND FISH: HOW WOULD THE PROPOSED ACTION AFFECT THE LOCAL MIGRATORY BIRD POPULATION?

3.6.1. Affected Environment

The analysis area for migratory birds consists of the project area and a 2-mile buffer (36,583 acres). This analysis area was chosen because it provides a distinct boundary that includes spatial buffers typically applied to migratory bird nests.

Migratory birds and raptors are protected under the MBTA and the Bald and Golden Eagle Protection Act. Migratory birds of particular concern that may inhabit the project area based on the site reconnaissance, available desktop resources, and correspondence with the BLM and UDWR include, but are not limited to, the bald eagle, Brewer's sparrow, broad-tailed hummingbird, burrowing owl, Cassin's finch, common raven, evening grosbeak, ferruginous hawk, golden eagle, horned lark, long-billed curlew, long-eared owl, mourning dove, northern harrier, northern mockingbird, olive-sided flycatcher, pinyon jay, rufous hummingbird, sagebrush sparrow, sage thrasher, Virginia's warbler, and western kingbird.

Migratory birds are particularly vulnerable to disturbance during nesting when eggs and / or pre-fledged chicks are present and cannot escape danger; therefore, the evaluation of impacts to migratory birds concentrated on the potential presence of a listed species during the breeding season and whether or not the species' nesting habitat was located on site. Migratory birds that were determined to be potentially impacted by the proposed project are discussed in **Table 3-12**.

Table 3-7. Migratory Birds Potentially Impacted by the Proposed Project

Species (Scientific Name) Conservation Status	Species Habitat Description	Habitat Present	Season Potentially Present	Potential to Occur	Pertinent Information
Bald eagle (*Haliaeetus leucocephalus*) BGEPA	Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds.	Yes	Non-Breeding	High	No large bodies of water are located on or near the AOI, and no suitable habitat for nesting was observed during the site reconnaissance. This species is not anticipated to nest in the project area; however, the species may utilize the project area for foraging and has been observed in the area during the winter months. The BLM has identified the primary nesting period for raptor species in the Milford Valley area as January 1 – August 31.

Species (Scientific Name) Conservation Status	Species Habitat Description	Habitat Present	Season Potentially Present	Potential to Occur	Pertinent Information
Brewer's sparrow **(***Spizella breweri***)** **--**	Breeding habitat for the Brewer's Sparrow is composed of shrublands and is closely associated with sagebrush-dominated landscapes. Nest site is almost always well concealed in low shrub, no more than 4' above ground (National Audubon Society 2024).	Yes	Breeding	Moderate	Breeding habitat for this species is located within the AOI, and this species was identified on site in an area of sagebrush during the field evaluation. A nest survey would be conducted to ensure the project does not negatively affect this species. If nests are identified, the spatial buffer for this species is a minimum of 100 feet. The BLM has identified the primary nesting period for non-raptor species in the Milford Valley area as March 1 – July 31.
Broad-tailed hummingbird *(Selasphorus platycercus)* **--**	Preferred habitat includes mountain meadows and forests. Breeds mostly in mountains, up to over 10,000 feet elevation. Mostly in rather open forest, especially near streams, including pine-oak and pinyon-juniper woods, and associations of spruce, Douglas-fir, and aspen. Migrants occur in all semi-open habitats of mountains and also make stopovers in lowlands (National Audubon Society 2024).	No	Breeding	Low	No mountain meadows or forests are located on or near the AOI, and no suitable habitat for nesting was observed during the site reconnaissance. This species is not anticipated to nest in the project area; however, the species may utilize the project area for foraging. The BLM has identified the primary nesting period for non-raptor species in the Milford Valley area as March 1 – July 31.
Burrowing owl *(Athene cunicularia)* **SS**	Open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows.	Yes	Breeding	High	Preferred habitat appears to be present throughout the project area, and several large burrows were noted throughout the project area that could potentially be utilized by this species. A nest survey would be conducted to ensure the proposed project does not negatively affect this species. If burrows are identified, the spatial buffer for this species is 0.25-mile. The seasonal buffer for this species is March 1 – August 31.

Species (Scientific Name) Conservation Status	Species Habitat Description	Habitat Present	Season Potentially Present	Potential to Occur	Pertinent Information
Cassin's finch (*Carpodacus cassinii*) BCC	Cassin's Finch is often found in mature forests of lodgepole and ponderosa pine. Winter range is similar to breeding habitat but with the bulk of populations at somewhat lower elevations. Nests have a foundation of fine twigs, rootlets, coarse weed stems, and often are lined with lichens.	No	Year-Round	Low	No forested areas are present within the AOI. This species is not anticipated to nest in the project area; however, the species may utilize the project area for foraging. The BLM has identified the primary nesting period for non-raptor species in the Milford Valley area as March 1 – July 31.
Common raven *(Corvus corax)* --	The common raven is habitat generalist and can utilize a variety of habitats including coniferous and deciduous forests, beaches, islands, chaparral, sagebrush, mountains, desert, grasslands, agricultural fields, tundra, and ice floes. They do well around human habitations including farms, rural settlements and isolated houses. Common Ravens build their nests on cliffs, in trees, and on structures such as power-line towers, telephone poles, billboards, and bridges (Cornell Lab of Ornithology 2024).	Yes	Year-Round	High	Preferred habitat appears to be present throughout the project area, and this species was observed throughout the project area during the field evaluation. A nest survey would be conducted to ensure the proposed project does not negatively affect this species. If nests are identified, the spatial buffer for this species is a minimum of 100 feet. The BLM has identified the primary nesting period for non-raptor species in the Milford Valley area as March 1 – July 31.
Evening grosbeak *(Coccothraustes vespertinus)* BCC	Evening grosbeak breeds in coniferous and mixed forests; often associated with spruce and fir in northern forest, with pines in western mountains. In migration and winter, may be equally common in deciduous groves in woodlands and semi-open country.	Yes	Non-Breeding	Low	Open habitat (utilized during migration and winter) is available within the AOI; however, coniferous and mixed forests (for breeding) are not; therefore, breeding individuals, nests, eggs, fledglings, etc. are not likely to be affected by the proposed project. \The BLM has identified the primary nesting period for non-raptor species in the Milford Valley area as March 1 – July 31.

Species (Scientific Name) Conservation Status	Species Habitat Description	Habitat Present	Season Potentially Present	Potential to Occur	Pertinent Information
Ferruginous hawk (*Buteo regalis*) SS	Open country, primarily prairies, plains and badlands; sagebrush, saltbush-greasewood shrubland, periphery of pinyon-juniper and other woodland, desert. Nests in tall trees or willows along streams or on steep slopes, in junipers, on cliff ledges, river-cut banks, hillsides, on power line towers, sometimes on sloped ground on the plains or on mounds in open desert. Generally, it avoids areas of intensive agriculture or human activity.	Yes	Breeding	High	Preferred habitat appears to be present throughout the project area. If project disturbance activities are to be conducted during the primary nesting season, a nest survey would be conducted to ensure the proposed project does not negatively affect this species. If nests are identified, the spatial buffer for this species is 0.5-mile. The seasonal buffer for this species is March 1 – August 1.
Golden eagle (*Aquila chrysaetos*) BGEPA	Inhabits open and semi-open country featuring native vegetation. Developed areas and uninterrupted stretches of forest are avoided. Found primarily in mountains up to 12,000 feet, canyonlands, rimrock terrain, and riverside cliffs and bluffs. Nest on cliffs and steep escarpments in grassland, chapparal, shrubland, forest, and other vegetated areas.	Yes	Year-Round	High	Open country is present throughout the entire AOI that would be suitable for foraging. Nesting is unlikely within the AOI but is possible on cliffs and mountains adjacent to the AOI; therefore, breeding individuals, nests, eggs, fledglings, etc. are not likely to be affected by the proposed project. The BLM has identified the primary nesting period for raptor species in the Milford Valley area as January 1 – August 31.
Horned lark (*Eremophila alpestris*) --	Horned larks favor bare, dry ground and areas of short, sparse vegetation; they avoid places where grasses grow more than a couple of inches high. Common habitats include prairies, deserts, tundra, beaches, dunes, and heavily grazed pastures (Cornell Lab of Ornithology 2024).	Yes	Year-Round	High	Preferred habitat appears to be present throughout the project area, and this species was observed throughout the project area during the field evaluation. If project disturbance activities are to be conducted during the primary nesting season, a nest survey would be conducted to ensure the proposed project does not negatively affect this species. If nests are identified, the spatial buffer for this species is a minimum of 100 feet. The BLM has identified the primary nesting period for non-raptor species in the Milford Valley area as March 1 – July 31.

Species (Scientific Name) Conservation Status	Species Habitat Description	Habitat Present	Season Potentially Present	Potential to Occur	Pertinent Information
Long-billed curlew (*Numenius americanus*) SS	Nests in dry prairies and moist meadows. Nests on ground usually in flat areas with short grass, sometimes on more irregular terrain, often near rock or other conspicuous objects. Mating season is from April through September.	Yes	Breeding	High	Grassy areas are present throughout the AOI. Additionally, several individuals and an active nest were observed during the field evaluation. If project disturbance activities are to be conducted during the primary nesting season, a nest survey would be conducted prior to construction to ensure that the proposed project would not negatively affect this species. If nests are identified, the spatial buffer for this species is a minimum of 100 feet. The BLM has identified the primary nesting period for non-raptor species in the Milford Valley area as March 1 – July 31.
Long-eared owl (*Asio otus*) BCC	Roost in dense vegetation and forage in open grasslands or shrublands; also, open coniferous or deciduous woodlands. n several western states individuals often build their nests in brushy vegetation adjacent to open habitats. Favored habitat includes dense trees for nesting and roosting and open country for hunting. Generally, avoids unbroken forest.	Yes	Year-Round	Moderate	Open grasslands and shrublands are located throughout the entire AOI and could potentially be utilized by the long-eared owl for hunting; however, preferred breeding habitat (dense wooded areas) are not located within the AOI; therefore, breeding individuals, nests, eggs, fledglings, etc. are not likely to be affected by the proposed project. The BLM has identified the primary nesting period for raptor species in the Milford Valley area as January 1 – August 31.

Species (Scientific Name) Conservation Status	Species Habitat Description	Habitat Present	Season Potentially Present	Potential to Occur	Pertinent Information
Mourning dove *(Zenaida macroura)* --	Primarily a bird of open country, scattered trees, and woodland edges, but large numbers roost in woodlots during winter. Feeds on ground in grasslands, agricultural fields, backyards, and roadsides. Typically nests amid dense foliage on the branch of an evergreen, orchard tree, mesquite, cottonwood, or vine. Also quite commonly nests on the ground, particularly in the West (Cornell Lab of Ornithology 2024).	Yes	Year-Round	High	Open country is present throughout the entire AOI that would be suitable for foraging. Woodland areas with dense foliage are not present within the project area; however, this species could still nest on the ground within the project area. If project disturbance activities are to be conducted during the primary nesting season, a nest survey would be conducted prior to construction to ensure that the proposed project would not negatively affect this species. If nests are identified, the spatial buffer for this species is a minimum of 100 feet. The BLM has identified the primary nesting period for non-raptor species in the Milford Valley area as March 1 – July 31.
Northern harrier *(Circus hudsonius*) BCC	Breeding individuals are most common in large, undisturbed tracts of wetlands and grasslands with low, thick, vegetation. Western populations tend to breed in dry upland habitats. During winter they use a range of habitats with low vegetation, including deserts, coastal sand dunes, pasturelands, croplands, dry plains, grasslands, old fields, estuaries, open floodplains, and marshes.	Yes	Year-Round	High	Grasslands and areas of low, thick, scrub shrub vegetation are present throughout the AOI and could potentially be utilized by the Northern Harrier for breeding. A nest survey would be conducted to ensure the project does not negatively affect this species. If nests are identified, the spatial buffer for this species is 0.5 miles. The BLM has identified the primary nesting period for raptor species in the Milford Valley area as January 1 – August 31.

Species (Scientific Name) Conservation Status	Species Habitat Description	Habitat Present	Season Potentially Present	Potential to Occur	Pertinent Information
Northern mockingbird *(Mimus polyglottos)* --	Year-round the northern mockingbird is found in areas with open ground and with shrubby vegetation like hedges, fruiting bushes, and thickets. When foraging on the ground, it prefers grassy areas, rather than bare spots. Common places to find Northern Mockingbirds include parkland, cultivated land, suburban areas and in second growth habitat at low elevations. Nest in shrubs and trees, typically 3-10 feet off the ground but sometimes as high as 60 feet (Cornell Lab of Ornithology 2024).	Yes	Year-Round	Moderate	Open ground with shrubby vegetation is present throughout the entire AOI that would be suitable for foraging. This species could potentially nest in some of the larger shrubs within the project area. If project disturbance activities are to be conducted during the primary nesting season, a nest survey would be conducted prior to construction to ensure that the proposed project would not negatively affect this species. If nests are identified, the spatial buffer for this species is a minimum of 100 feet. The BLM has identified the primary nesting period for non-raptor species in the Milford Valley area as March 1 – July 31.
Olive-sided flycatcher (*Contopus cooperi*) BCC	Breeds mostly in northern and montane coniferous forest from sea level to timberline and the edge of the tundra. They are most numerous in mid- and higher-elevation forest in mountains (3,000–7,000 feet elevation) and around burned or boggy areas with numerous openings and dead trees. Migrants and wintering birds also favor gaps in coniferous forest.	No	Breeding	Low	Coniferous and mixed forests (for breeding) are not located within the AOI; therefore, breeding individuals, nests, eggs, fledglings, etc. are not likely to be affected by the proposed project. The BLM has identified the primary nesting period for non-raptor species in the Milford Valley area as March 1 – July 31.

Species (Scientific Name) Conservation Status	Species Habitat Description	Habitat Present	Season Potentially Present	Potential to Occur	Pertinent Information
Pinyon jay (*Contopus cooperi*) BCC	Pinyon jays occupy pinyon-juniper woodlands, sagebrush, scrub oak, chaparral, and ponderosa pine forests year-round. The pinyon jay can also be found on dry mountain slopes and foothills near pinyon-juniper forests.	Yes	Year-Round	Moderate	Sagebrush habitat is located within the AOI and could potentially be utilized by the Pinyon Jay for caching. Only a small portion in the south end of the AOI contains potential breeding habitat (pinyon-juniper woodlands); therefore, breeding individuals, nests, eggs, fledglings, etc. are not likely to be affected by the proposed project if nesting surveys are completed and buffers are applied; however, there are two pinyon jay nesting colonies located nearby on BLM land just outside the AOI. The BLM has identified the primary nesting period for non-raptor species in the Milford Valley area as March 1 – July 31.
Rufous hummingbird (*Selasphorus rufus*) BCC	Rufous hummingbirds breed in open areas, yards, parks, and forests up to the tree line. Breeds in Oregon, Washington, Idaho, western Canada, and southern Alaska. During migration, they pass through mountain meadows as high as 12,600 feet where nectar-rich, tubular flowers are blooming (Cornell Lab of Ornithology 2024).	Yes	Migration	Moderate	This species may utilize the AOI during migration; however, this species does not breed in Utah; therefore, breeding individuals, nests, eggs, fledglings, etc. are not likely to be affected by the proposed project. The BLM has identified the primary nesting period for non-raptor species in the Milford Valley area as March 1 – July 31.

Species (Scientific Name) Conservation Status	Species Habitat Description	Habitat Present	Season Potentially Present	Potential to Occur	Pertinent Information
Sagebrush sparrow (*Artemisiospiza nevadensis*) --	Typically breed in shrub-steppe habitats consisting of shrubs up to about 6 feet tall, especially big sagebrush as well as saltbush, rabbitbrush, shadscale, and bitterbrush. They are mostly found below about 5,600 feet elevation. They also nest in mixed sagebrush-juniper habitat that borders open sagebrush steppe. During migration and winter, often congregate in loose flocks with other sparrow species and use dry shrublands or grasslands, including creosote and saltbush-dominated desert scrub, yucca, honey mesquite, and greasewood (Cornell Lab of Ornithology 2024).	Yes	Breeding	High	Individuals were identified in the western portion of the AOI in areas of sagebrush. Preferred habitat appears to be present throughout the northern and western portions of the AOI. A nest survey would be conducted to ensure the project does not negatively affect this species. If nests are identified, the spatial buffer for this species is a minimum of 100 feet. The seasonal buffer for this species is April 1 – August 15.
Sage thrasher (*Oreoscoptes montanus*) BCC	The sage thrasher breeds exclusively in shrub-steppe habitats. Expanses of dense sagebrush provide concealment, while bare ground provides foraging opportunities. During migration and winter, they transition to grasslands with scattered shrubs and open pinyon-juniper woodlands. This species breeds from April to August.	Yes	Breeding	High	Individuals were identified in the western portion of the AOI in areas of sagebrush. Preferred habitat appears to be present throughout the northern and western portions of the AOI. A nest survey would be conducted to ensure the project does not negatively affect this species. If nests are identified, the spatial buffer for this species is a minimum of 100 feet. The seasonal buffer for this species is April 1 – August 15.
Virginia's warbler (*Vermivora virginiae*) BCC	Virginia's warbler is common in dense oak and pinyon woodlands and brushy streamside hills. Typically breeds in pinon-juniper woodlands while wintering in oak woodlands. The nest is an open cup placed on the ground and is composed of dead plant material and grass.	No	Breeding	Low	No forested areas are present within the AOI; therefore, breeding individuals, nests, eggs, fledglings, etc. are not likely to be affected by the proposed project. The BLM has identified the primary nesting period for non-raptor species in the Milford Valley area as March 1 – July 31.

Species (Scientific Name) Conservation Status	Species Habitat Description	Habitat Present	Season Potentially Present	Potential to Occur	Pertinent Information
Western kingbird *(Tyrannus verticalis)* --	Semi-open country, including grasslands, farms, roadsides, and towns. Breeds in open terrain with trees to provide nest sites; may be in farmland, groves or streamside trees in prairie country, semi-desert scrub; avoids true desert. Also, in towns; where trees are lacking, will nest on artificial structures including utility poles and fences (National Audubon Society 2024).	Yes	Breeding	High	Open country is present throughout the entire AOI that would be suitable for foraging. Trees are not present within the project area; however, this species could still nest on artificial structures within the project area. If project disturbance activities are to be conducted during the primary nesting season, a nest survey would be conducted prior to construction to ensure that the proposed project would not negatively affect this species. If nests are identified, the spatial buffer for this species is a minimum of 100 feet. The BLM has identified the primary nesting period for non-raptor species in the Milford Valley area as March 1 – July 31.

BCC = Bird of Conservation Concern
BGEPA = Bald and Golden Eagle Protection Act
SS = BLM Sensitive Species
-- = No conservation status other than MBTA

Past and Present Surface-Disturbing Activities

Past and present land-disturbing activities in the vegetation analysis area were estimated through acres of land with disturbed or developed SWReGAP land cover classes (Lowry et al. 2005) in combination with the results from the aerial imagery review (ESRI 2024). Disturbed or developed land cover classes within the migratory bird analysis area are shown on **Figure 3-1**. Disturbed or developed land cover classes indicate impacts to migratory birds and their habitats from sources related to human activity. Approximately 1,730 acres (4.7%) of the migratory bird analysis area appears to have been impacted by past and present surface disturbing activities and approximately 26,386 acres (72.1%) has been disturbed by wildfires (**Table 3-1**). Disturbance-causing elements in the analysis area contributing to past and present disturbance acreage include the Milford Wind Project, hog farms, agricultural use, transmission lines, roads, fences, grazing, geothermal projects, solar farms, and the Milford Flat Fire. Impacts to migratory birds from these land-disturbing activities include habitat loss and habitat fragmentation, particularly foraging and nesting habitat, and visual and auditory disturbance. Direct injury and mortality of migratory birds may also result from these past and present activities including from construction activities, vehicle traffic, and ongoing facility operations (wind turbines, transmission lines).

3.6.2. Environmental Impacts—No Action Alternative

Under the No Action Alternative, there would be no impacts to migratory birds in the project area as a result of the Proposed Action; however, because of existing geothermal leases within the AOI, exploration and development within the AOI are RFFAs under lease rights. Therefore, impacts to migratory birds similar to those discussed in Section 3.8.3 would likely result from RFFAs within the analysis area.

3.6.3. Environmental Impacts—Proposed Action

Impacts to migratory birds were analyzed by reviewing the potential for direct injury and mortality of migratory birds, the potential for loss and degradation of habitat, and the potential affects to species' overall population numbers and health. The Proposed Action would result in up to 631.32 acres of surface disturbance (approximately 1.7% of the analysis area). The proposed project would impact Great Basin Xeric Mixed Sagebrush Shrubland, Inter-Mountain Basins Big Sagebrush Shrubland, Inter-Mountain Basins Greasewood Flat, Inter-Mountain Basins Mixed Salt Desert Scrub, Inter-Mountain Basins Semi-Desert Grassland, Inter-Mountain Basins Semi-Desert Shrub, Invasive Annual and Biennial Forbland, Invasive Annual Grassland, and Invasive Perennial Grassland habitat types.

Expected impacts to migratory birds would include accidental take from increased vehicular traffic, the loss and degradation of habitat, disruption of bird breeding territory establishment, auditory and visual disturbances to individual birds present in or near the project area during construction and drilling activities, and effects to species' overall population numbers and health.

In addition to potential habitat impacts, noise from drill rigs and construction activities can disturb wildlife in adjacent habitats up to 2,500 feet away (USFS and BLM 2008). If migratory birds are present during project activities, individuals would likely leave the immediate area, resulting in a temporary, or perhaps permanent spatial redistribution of migratory birds or habitat-use patterns. Additional stress could occur as a result of the increased noise and human activity that would likely result in changes in food intake and foraging rates, which could cause individual animals to select suboptimal habitat, abandon nests, or interrupt chick-rearing or mating. Migratory birds would also use extra exertion to escape disruptions that could result in the depletion of energy stores at the expense of growth and reproduction. The energy spent avoiding noise and human activity could also impact the ability of migratory birds to respond to other adverse conditions, either through distraction or lack of energy. Noise effects from construction activities associated with the Proposed Action would primarily be a direct, short-term impact that would disappear at the completion of each project; however, some human activity and noise associated with geothermal plant operations associated with the Proposed Action would be present consistently and in the long term (BLM 2016), until facility decommissioning and the final reclamation of the project area. Based on the development of migratory bird design features, including nest surveys, and adherence to the BLM-provided migratory bird stipulations (**Appendix D**), potential impacts to migratory birds would be minimized. As stated in **Appendix D**, if project activities are to be conducted during the primary nesting season for migratory birds (March 1st - July 31st for non-raptors and January 1st – August 31st for raptors), nesting surveys would be conducted by a qualified biologist.

Cumulative Impacts

Past actions, present actions, and RFFAs could cumulatively affect migratory bird species through loss of habitat and habitat degradation, habitat fragmentation, disruption of seasonal patterns or migration corridors, displacement of individual birds, increase of collisions between birds and vehicles, and impacts of the health of migratory birds due to stress (BLM 2016). The Proposed Action would add incrementally to the acreage of migratory bird impacts from past and present surface-disturbing activities (1,730 acres) and quantifiable RFFAs (15 acres, **Table 3-3**) in the analysis area including the Milford Wind Project, hog farms, agricultural use, transmission lines, roads, fences, grazing, geothermal projects, solar farms, and the Milford Flat Fire. The approximately 631 acres of surface disturbance from the Proposed Action would represent a 36.5% increase to the approximately 1,730 acres of past and present surface disturbance to migratory birds in the analysis area (**Figure 3-1**). Including the quantifiable RFFAs within the analysis area, this proposed increase of surface disturbance would result in a cumulative 6.5% of disturbance within the migratory bird analysis area. In addition to the direct impacts to migratory bird habitat, indirect impacts to migratory birds could result from habitat fragmentation and degradation of seasonal patterns and migration

corridors extending beyond the direct approximately 631 acres of habitat disturbance. Functional habitat loss may also be greater due to avoidance behaviors resulting from construction and operation activities; however, the total amount is difficult to assess and likely dependent on adjacent habitat quality and other disturbances. The severity of the cumulative impacts would depend on factors such as the sensitivity of the species affected, seasonal intensity of use, and physical parameters (e.g., topography, forage, and cover availability) (BLM 2016).

The BLM recently offered a competitive geothermal lease sale for 11 parcels in Beaver and Millard Counties, totaling approximately 32,527 acres (BLM 2022). Approximately 13,824 acres of the migratory bird analysis area (13.7%) was included in the geothermal lease sale. Exploration and development on future leases could cause additional impacts to migratory birds; however, with the exception of the 15 acres of surface disturbance proposed from the recently approved Rodatherm Geothermal Pilot Project, these impacts are not quantifiable at the leasing sale stage of the process because no specific projects have been proposed.

Long-term migratory bird habitat disturbance would be minimized by the interim reclamation of areas no longer in use or determined to be commercially non-viable throughout project implementation, and by the final reclamation of the project area following project completion **(Appendix D**). Due to the time, it may take for vegetation to fully reestablish, complete reclamation of migratory bird habitat would take several years. Functional habitat loss may be greater than the proposed 631 acres of habitat disturbance due to avoidance behaviors resulting from construction, operation, and initial reclamation activities.

3.7. ISSUE #5. HOW WOULD THE PROPOSED PROJECT IMPACT PRONGHORN, THE QUALITY OF THEIR HABITAT, AND THE CUMULATIVE IMPACTS TO THEIR HABITAT CONNECTIVITY / MOVEMENT CORRIDORS IN THE MILFORD VALLEY AREA?

3.7.1. Affected Environment

The project area is located within the Beaver River: Antelope Spring – Cove Creek, Beaver Bottoms - Beaver River, Negro Mag Wash, and Wild Horse Canyon subwatersheds within the larger Beaver Bottoms-Upper Beaver Watershed (HUC 16030007). The AOI extends into two additional subwatersheds, Milford Municipal Airport – Beaver River and Corral Canyon. The Antelope Spring – Cove Creek, Beaver Bottoms - Beaver River, Negro Mag Wash, and Wild Horse Canyon subwatersheds and the portions of the Milford Municipal Airport – Beaver River and Corral Canyon subwatersheds within the AOI (106,182 acres) were selected as the analysis area because it encompasses the AOI and provides a distinct boundary in which to analyze the proposed project's potential impacts to pronghorn in the area (**Figure 3-4**).

The project area and the majority of the analysis area are located within UDWR Wildlife Management Unit #22 – Beaver. The closest study to the project area is Big Cedar Cove (Study No. 22-12), which was reviewed to characterize vegetation trends and wildlife responses in the analysis area over the past decades (1985 – 2018) (UDWR 2018b). Following the Milford Flat wildfire, vegetation within the area transitioned from Wyoming Big Sagebrush to Annual-Perennial Grass, with cheatgrass persisting as a co-dominant species (UDWR 2018b). The transition from shrubland habitat into a perennial grassland habitat is a contributing factor to the local decline in big game species within the analysis area. According to the results from Big Cedar Cove (Study No. 22-12), preferred browse cover within the area dropped from 22.6% in 2003 (pre-wildfire) to 0.2% in 2008 (post-wildfire). Although preferred browse cover increased to 3.4% as of 2018 (UDWR 2018b), with the RFFAs in the analysis area, this area is likely to remain dominated by perennial grasses and annual invasives such as cheatgrass. See Section 3.7 for additional information on vegetation cover types in the project area.

Pronghorn generally reside in sagebrush and grassland habitat with large expanses of open, rolling, or flat terrain and the presence of high-quality browse (UDWR 2017). Based on UDWR geospatial data, the project area that includes the proposed disturbance directly overlaps with crucial year-long habitat for pronghorn. Pronghorn crucial year-long habitat encompasses 86,384 acres (81.4%) of the analysis area. Crucial value habitat is essential to the life history requirements of a wildlife species. Degradation or unavailability of crucial habitat will lead to significant declines in carrying capacity and/or numbers of pronghorn.

Currently, habitat loss and habitat degradation are major concerns for pronghorn in Utah. Past and present surface-disturbing activities in the analysis area that have affected pronghorn habitat include renewable energy production facilities (geothermal, solar, and wind), roads and highways, railways, utility lines, agricultural production and associated fences, and wildfire.

In addition to the direct loss of habitat from past and present surface disturbing activities, pronghorn are also impacted from functional loss of habitat by indirect effects from human activities which include avoidance behaviors resulting in habitat fragmentation, interruption of migration corridors, restriction of access to water, and the introduction of invasive vegetation species.

A leading component of development impacting pronghorn is fencing. Unlike deer or elk, pronghorn are generally unable to jump over fences. Fencing creates barriers to the movement of pronghorn that can impact pronghorn seasonal movements and / or daily activities. Fencing may also cause injury and unnecessary fatalities of pronghorn which can get snared on barbs or fatally entangled (Paige 2008). Beckmann and Seidler (2009) noted the distance to the nearest fence independent of the distance to the nearest paved road, nearest graded road, nearest energy structure, and nearest human observer; had a statistically significant impact on the foraging rates of pronghorn. This study suggests that, in addition to increasing injury and mortality of pronghorn and impacting migration and access to water or feeding areas, fencing within pronghorn habitat also impacts foraging rates. With the exception of the exclusionary fencing around reserve pits, power plants, and the switchyard, which would consist of chain-link fencing or other BLM-approved fencing recommendations, EDR would use fencing consistent with the UDWR-recommended specifications for pronghorn (**Appendix D**).

Past and Present Surface-Disturbing Activities

Past and present land-disturbing activities in the pronghorn analysis area were calculated on BLM lands. In this analysis, a conservative 100m buffer (Taylor and Knight 2003, Larson et al. 2016) was utilized around roads and other human related developments within the pronghorn analysis areas to represent "functionally altered and or lost" habitat and quantify the scale of direct and indirect disturbance to pronghorn habitat. Disturbed or developed land cover classes within the big game analysis area are shown on **Figure 3-1**.

Past and present surface-disturbing activities in the analysis area that have affected pronghorn habitat include the Milford Wind Project, hog farms, transmission lines, roads, railroad tracks, fences, grazing, geothermal projects, solar farms, and the Milford Flat Fire. Pronghorn are also impacted by indirect effects from land-disturbing activities including habitat fragmentation, interruption of migration corridors, restriction of access to water, and the introduction of invasive vegetation species.

Hall et al. 1997 defined 'habitat' as "the resources and conditions present in an area that produce occupancy – including survival and reproduction – by a given organism" and argued that it is organism-specific. The term 'habitat' implies more than vegetation or vegetation structure and is the sum of the specific resources needed by organisms (Hall et al. 1997). For the pronghorn analysis and considering these definitions and identified limitations to local pronghorn populations, functional habitat loss in the analysis area was calculated by identifying the number of acres of surface disturbance multiplied by a 100-m (330-foot) buffer to account for changes in vegetation, noise, human presence, etc. that create avoidance behaviors in wildlife.

Approximately 19,385 acres (44% of available habitat on BLM) of functional habitat within the pronghorn analysis area have been previously disturbed **(Table 3-13**). When wildfires are included in the analysis, approximately 40,173acres or 91% of mapped pronghorn habitat on BLM lands within the analysis area has been previously disturbed.

Table 3-8. Existing Disturbance in Pronghorn Habitat in the Analysis Area on BLM lands.

Pronghorn Habitat Type	Mapped Habitat in Analysis Area (Acres)	Existing Disturbance in Habitat within Analysis Area (acres)	Existing Disturbance in Habitat within Analysis Area (%)	Total Habitat Disturbed Including Wildfires (acres)	Total Habitat Disturbed Including Wildfires (%)
Crucial, Year-long	44,186	19,385.81	43.87%	40,173.29	90.9%

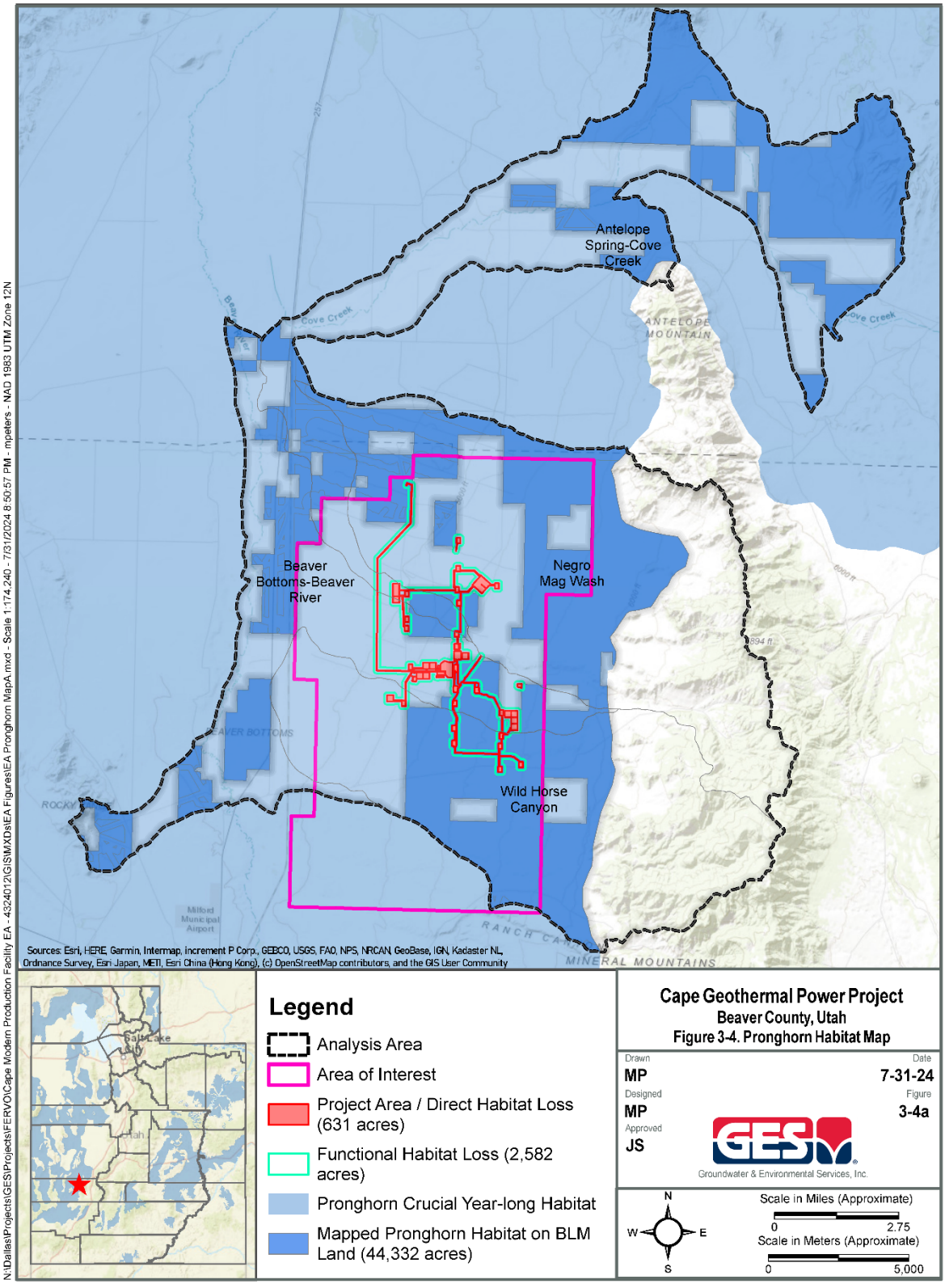

Figure 3-4a. Pronghorn Habitat Map (Project Area).

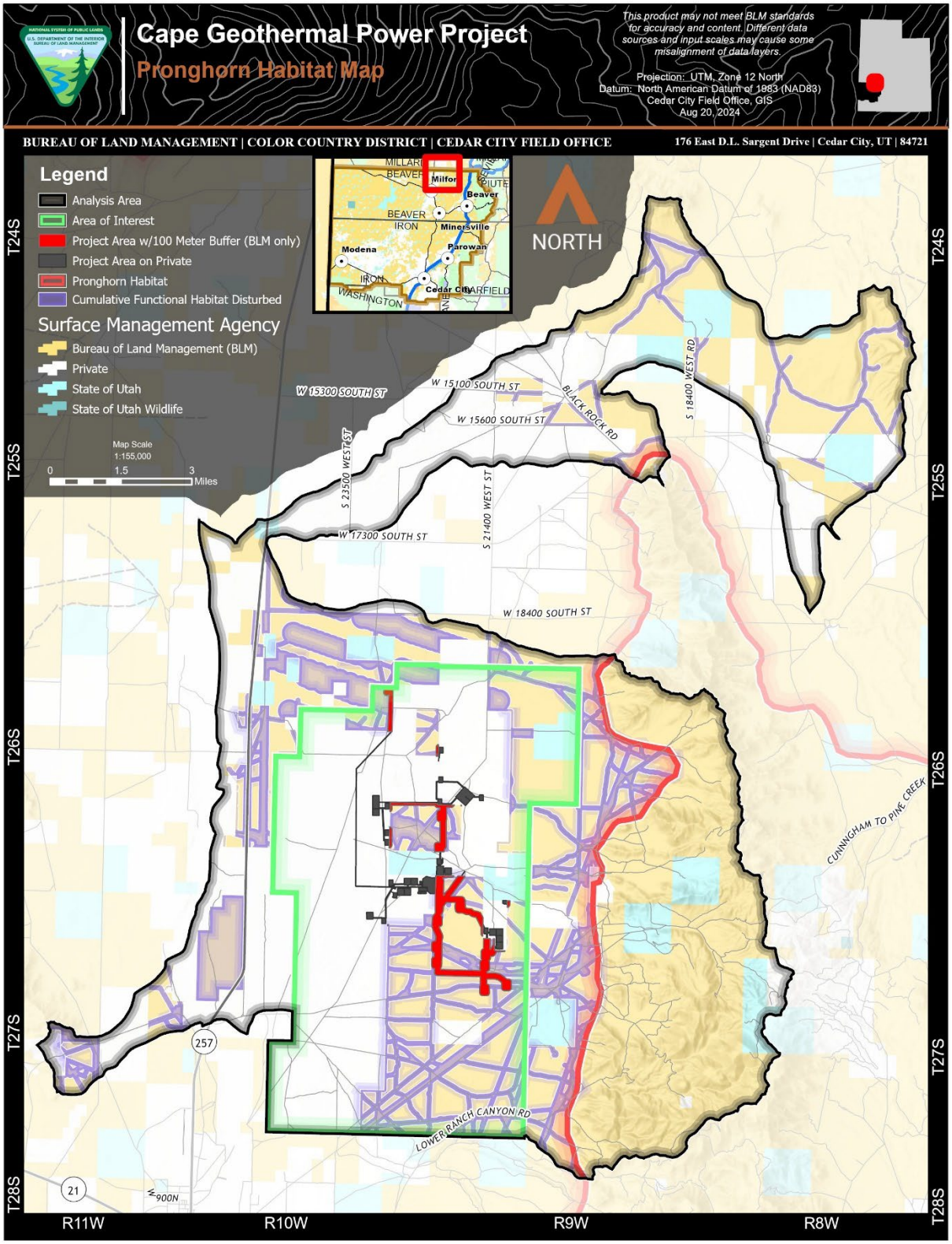

Figure 3-4b. Pronghorn Habitat Map (Cumulative Disturbance).

3.7.2. Environmental Impacts— No Action Alternative

Under the No Action Alternative, the BLM would not approve EDR's Plan of Operations (see **Appendix A**), and the ROW for a portion of an off-lease transmission line would not be granted. The proposed power plants, well pads, transmission lines, pipelines, and access roads would not be constructed on BLM lands, and associated surface disturbance would not occur. However, because of the existing geothermal leases within the AOI, exploration and development within the AOI are RFFAs under lease rights that could impact crucial pronghorn habitat.

3.7.3. Environmental Impacts—Proposed Action

According to the Geothermal Programmatic EIS (BLM and USFS 2008), the main impacts on big game resources from geothermal development consist of habitat disturbance (including removal, reduction, or fragmentation of habitat), the potential for direct injury and mortality from vehicles, increased erosion and runoff, increased fugitive dust, noise and visual impacts, potential exposure to contaminants (e.g., diesel fuel or geothermal working fluid), interference with behavior activities, and potential long-term effects from the introduction of invasive species.

Table 3-9. Proposed Disturbance to Pronghorn Habitat in the Analysis Area across all landownerships.

Pronghorn Habitat Type	Habitat in Analysis Area (Acres on All Landownerships)	Project Area Direct Habitat Loss (acres)	Analysis Area Direct Habitat Loss (%)	Project Area Functional Habitat Loss (acres)	Analysis Area Functional Habitat Loss (% on All Landownerships)
Year-Long, Crucial	86,384	631	0.7%	2,582	3.0%

Habitat loss would result from pronghorn avoiding the area during construction activity or due to human presence, noise, habitat fragmentation, and degradation of movement corridors. Surface disturbances from the Proposed Action would result in disturbance of up to 631 acres of direct crucial pronghorn habitat loss and 2,582 acres of functional habitat loss. The direct and functional habitat loss together represents 3.7% of the crucial year-long pronghorn habitat mapped in the analysis area (86,384 acres). Approximately 944 acres (36%) of the total 2,582 acres of functional habitat loss would be on BLM land. Initial construction surface disturbance would be limited to avoid pronghorn fawning season (May 1st through June 30th). Where fencing is necessary, EDR would use fencing consistent with the UDWR-recommended specifications for wildlife, including a smooth bottom wire to be compatible with big game species, and exclusionary fencing would be installed around reserve pits, power plants, and the switchyard that would help to minimize potential impacts to big game species (**Appendix D**). Additionally, EDR is contributing to a water development and shrub enhancement project, in coordination with UDWR, to minimize and mitigate potential impacts to pronghorn that may utilize the project area (**Appendix D**).

Cumulative Impacts

Cumulative impacts would have the greatest effect on pronghorn due to existing conditions of fragmented movement corridors and areas of perpetual surface disturbance. Researchers have found evidence that migratory behavior of ungulates decreases as disturbance increases (Lendrum et al. 2012. 2013, Sawyer et al. 2013, Blum et al. 2015, Wyckoff et al. 2018, Sawyer et al. 2020).

Past actions, present actions, and RFFAs would cumulatively affect pronghorn through increased habitat degradation, habitat fragmentation, disruption of seasonal patterns or migration corridors, displacement of

pronghorn, increase of collisions between pronghorn and vehicles, and impacts of the health of pronghorn due to stress. Big game wildlife species including pronghorn, are susceptible to impacts due to their dependence on specific habitat types, sensitivity to disturbance, and ongoing habitat losses.

Cumulative impacts to functional habitat include calculation of previously disturbed acres in the analysis area with a 100-m buffer to estimate cumulative functional habitat loss (indirect disturbance) within mapped pronghorn habitat. Approximately 19,385 acres (44%) of the available functional habitat on BLM lands within the analysis area has been previously disturbed. The Proposed Action would result in the functional habitat loss of 2,582 acres of mapped pronghorn habitat on both private and BLM lands. The additional habitat loss beyond previously disturbed acres on BLM is 284 acres for a cumulative total of 45.4% disturbance in suitable pronghorn habitat on BLM lands. When wildfires are included in the analysis, the Proposed Action would add an additional 5 acres to the approximately 90.9% of mapped pronghorn habitat within the analysis area.

Table 3-10. Cumulative Disturbance to Pronghorn Habitat in the Analysis Area on BLM lands.

Pronghorn Habitat Type	Habitat in Analysis Area (Acres)	Existing Functional Habitat Disturbed within Analysis Area	Functional Habitat Disturbed in Analysis Area (%)	Proposed Action Contribution to New Disturbed Habitat (acres)	Total Existing and New Disturbed Habitat (acres)	Total Existing and New Disturbed Habitat (%)
Crucial, Year-long	44,186	19,385.81	43.87%	284	19,669.81	45.4%

The area has been highly impacted by development which has human presence throughout the analysis area. Additionally, the Milford Flat fire has dramatically altered the vegetation in the area as well. This will have a long-term influence on the total number of pronghorn utilizing the area and using it in their movements. (Lendrum et al. 2012. 2013, Sawyer et al. 2013, Blum et al. 2015, Wyckoff et al. 2018, Sawyer et al. 2020). Sawyer et al. (2017) reported a long-term research project that refutes the prevailing notion that big game will habituate to human disturbance and instead demonstrated that development can have long term consequences through avoidance behavior and the resulting functional loss of habitat. In a study conducted in WY on energy development, it was reported that there was a threshold of 3% surface disturbance where mule deer habitat use declined and altered migratory behavior (Sawyer et al. 2020), however it is unknown if this threshold also applied specifically to pronghorn.

3.8. ISSUE #6 HOW WOULD THE PROPOSED PROJECT IMPACT KIT FOX, THE QUALITY OF THEIR HABITAT, AND THE CUMULATIVE IMPACTS TO THEIR HABITAT CONNECTIVITY IN THE MILFORD VALLEY AREA.

3.8.1. Affected Environment

Kit foxes are especially susceptible to impacts due to limited movement corridors and perpetual surface disturbance within the Milford Valley area. Natural habitats occupied by the kit fox throughout the western United States are being converted (agricultural, renewable energy) and threaten the long-term survival of the kit fox (Cypher and List 2014). Kit fox have previously been documented using this area; however local declines have been observed by BLM.

Kit fox are associated with desert shrub vegetation such as shadscale (*Atriplex confertifolia*), saltbush (*Atriplex nummularia*), sagebrush (*Artemisia tridentata*), and greasewood (*Adenostoma fasciculatum*), and prefer relatively flat areas (UDWR 2020). This species is often found in areas with an overall vegetative

cover of less than 20% and prefer to den in loamy, clay soils on areas with slightly higher elevation than the surrounding area.

Home range size for the kit fox varies from 620 acres to 2,866 acres. For this analysis, a 4.5-mile radius of the project area (94,568 acres or 38,270 ha) was selected as a conservative analysis area for kit fox to include a possible home range from any location within the project area. Approximately 48,504 acres of the kit fox analysis area are on BLM-administered lands, 39,217 acres includes private land, and the remaining 5,901 acres includes TLA lands. The BLM has modeled kit fox habitat within the vicinity of the project area as 'Poor', 'Fair', 'Good', and 'Very Good' with 'Very Good' having the highest suitability and 'Poor' or having the lowest suitability where occupancy is unlikely. Areas designated 'Very Good' and 'Good' are considered suitable kit fox habitat and most likely to be occupied by kit fox (**Figure 3-6**). Kit fox habitat within the analysis area is summarized in **Table 3-16**.

According to modeled kit fox habitat data, there are approximately 20,857 acres of Habitat Index 1 (Very Good), 57,983 acres of Habitat Index 2 (Good), 9,494 acres of Habitat Index 3 (Fair), and 6,236 acres of Habitat Index 4 (Poor) modeled habitat for kit foxes in the analysis area (**Table 3-16; Figure 3-5a**).

Past and Present Surface-Disturbing Activities

Past and present land-disturbing activities in the pronghorn analysis area were calculated on BLM lands. In this analysis, a conservative 100m buffer (Taylor and Knight 2003, Larson et al. 2016) was utilized around roads and other human related developments within the kit fox analysis areas to represent "functionally altered and or lost" habitat and quantify the scale of direct and indirect disturbance to kit fox habitat. Disturbed or developed land cover classes within the kit fox analysis area are shown on **Figure 3-1**.

Past and present surface-disturbing activities in the analysis area that have affected kit fox habitat include mineral exploration and development, renewable energy production facilities (geothermal, solar, and wind), utility lines, railways, and road construction, as well as hog farms, livestock grazing and range improvement projects, and the Milford Flat Fire. Impacts to kit fox from these land-disturbing activities include loss of habitat from development, habitat fragmentation, and an increase of invasive vegetation which is consistent with threats to this sensitive species decline (Cypher and List 2014, UDWR 2024a). Approximately 4,026 acres (4.3%) of the kit fox analysis area appears to have been directly impacted by past and present surface disturbing activities. Of the 4,026 acres of past and present disturbance, approximately 3,678 acres (3.9% of the kit fox analysis area) were modeled as suitable kit fox habitat.

Hall et al. 1997 defined 'habitat' as "the resources and conditions present in an area that produce occupancy – including survival and reproduction – by a given organism" and argued that it is organism-specific. The term 'habitat' implies more than vegetation or vegetation structure and is the sum of the specific resources needed by organisms (Hall et al. 1997). Similar to the pronghorn analysis, and considering these definitions and identified threats to kit fox (Cypher and List 2014, UDWR 2024a), functional habitat loss in Milford Valley was calculated by identifying the number of acres of surface disturbance multiplied by a conservative 100-m (330-foot) buffer to account for changes in vegetation, noise, human presence, etc. that create avoidance behaviors in wildlife (Taylor and Knight 2003, Preisler et al. 2014, Larson et al. 2016, Sawyer et al. 2017). Approximately 19,116.24 acres of the available 36,200.4 acres of "very good" and "good" habitat has been previously disturbed and functionally lost which is approximately 53% within the kit fox analysis area on BLM lands. When wildfires are included in the analysis, previous disturbance on BLM lands is 31,756.17 acres or 87.7% (Table 3-16).

Table 3-11. Existing Disturbance to Modeled Kit Fox Habitat in the Analysis Area on BLM lands.

Kit Fox Habitat	Habitat in Analysis Area (acres)	Existing Disturbance in Habitat within Analysis Area (acres)	Existing Disturbance in Habitat within Analysis Area (%)	Existing Disturbance in Habitat within Analysis Area including Wildfire (acres)	Existing Disturbance in Habitat within Analysis Area including Wildfire (%)
Very Good	6,953.47	3,980.32	57.2%	4,171.29	60.0%
Good	29,246.93	15,135.92	51.8%	27,584.88	94.3%
Fair	8,215.52	3,335.52	40.6%	8,022.63	97.7%
Poor	4,088.84	889.37	21.8%	3,845.24	94%
Total	**48,504.76**	**23,341.13**	**48.1%**	**43,624.04**	**89.9%**

3.8.2. Environmental Impacts—No Action Alternative

Under the No Action Alternative, there would be no changes to wildlife habitat in the project area as a result of the Proposed Action; however, because of the existing geothermal leases within the AOI, exploration and development within the AOI are RFFAs under lease rights. Therefore, surface disturbance activities and structural developments associated with RFFAs (such as fences, signs, powerlines, meteorological towers, communication towers, and renewable energy developments) are likely to diminish the capacity of the analysis area to support wildlife (BLM CCFO 2019) regardless of if the Proposed Action is approved.

3.8.3. Environmental Impacts—Proposed Action

Impacts to wildlife, including kit fox, were analyzed by reviewing the potential direct injury and mortality of wildlife, the potential for loss and degradation of habitat, the potential auditory and visual disturbances to individual wildlife present in or near the project area during construction and drilling activities, and the potential affects to species' overall population numbers and health. According to the Geothermal Programmatic EIS (BLM and USFS 2008), the main impacts on wildlife resources from geothermal development consist of habitat disturbance (including removal, reduction, or fragmentation of habitat), the potential for direct injury and mortality from vehicles, increased erosion and runoff, increased fugitive dust, noise and visual impacts, potential exposure to contaminants (e.g., diesel fuel or geothermal working fluid), interference with behavior activities, and potential long-term effects from the introduction of invasive species.

Surface disturbances from the Proposed Action would result in disturbance of up to 631 acres of direct habitat loss, 620 acres of which are modeled as suitable kit fox habitat. Functional habitat loss from the Proposed Action was calculated by quantifying suitable kit fox habitat within a 100-m buffer of the project area. The project area with a 100-m buffer encompasses approximately 2,582 acres which is primarily in "very good" and "good" habitat for kit fox (Table 3-17).

Table 3-12. Proposed Disturbance to Modeled Kit Fox Habitat in the Analysis Area

Kit Fox Habitat	Habitat in Analysis Area (acres)	BLM Acres within Analysis Area	Project Area Direct Habitat Loss (acres)	Analysis Area Direct Habitat Loss (%)	Project Area Functional Habitat Loss (acres)	Analysis Area Functional Habitat Loss (%)
Very Good	20,857	6,957	67	0.3%	441	2.1%
Good	57,983	29,081	553	1.0%	2,094	3.6%

Fair	9,494	8,262	3	0.03%	14	0.15%
Poor	6,236	5,150	8	0.1%	33	0.5%
Total	**94,568**	**49,450**	**631**	**0.6%**	**2,582**	**2.7%**

The 620 acres would represent a direct habitat loss, and the 2,535 acres would represent a functional habitat loss. Approximately 155 acres of the direct habitat loss and 889 acres of the functional habitat loss would occur on BLM lands. The direct and functional habitat loss together represents 2.7% of the modeled habitat for this species in the entire analysis area. The aforementioned acreage would represent the habitat lost until facility decommissioning and the final reclamation of the project area occurs. Due to the time it may take for vegetation to fully reestablish, complete reclamation of habitat would take several years.

Cumulative Impacts

Cumulative impacts would have the greatest effect on kit fox due to existing conditions of fragmented movement corridors and areas of perpetual surface disturbance and known impacts to the species in their range (Cypher and List 2014) and in Milford Valley. Past actions, present actions, and RFFAs would cumulatively affect kit fox through habitat degradation, habitat fragmentation, disruption of movements, displacement of individuals, increase of collisions between wildlife and vehicles, and impacts on the health of individuals due to stress. Special-status wildlife species, including kit fox, are more susceptible to impacts due to their dependence on specific habitat types, sensitivity to disturbance, declining population numbers, and ongoing habitat losses.

Cumulative impacts to functional habitat include calculation of previously disturbed acres in the analysis area with a 100-m buffer to estimate cumulative functional habitat loss (indirect disturbance) within mapped pronghorn habitat. Approximately 19,113.24 acres of the 36,200.4 (52.7%) of the most likely areas occupied by kit fox have been previously disturbed. The Proposed Action would result in the functional habitat loss of 2,582 acres of mapped pronghorn habitat on both private and BLM lands. The additional habitat loss beyond previously disturbed acres on BLM is 284 acres for a cumulative total of 53.5% disturbance in suitable kit fox habitat on BLM lands. When wildfires are included in the analysis, the Proposed Action would add an additional 5 acres to the approximately 89.9% of kit fox habitat within the analysis area (Table 3-18).

Table 3-13. Cumulative Disturbance to Kit Fox Habitat in the Analysis Area on BLM lands.

Kit Fox Habitat	Habitat in Analysis Area (acres)	Existing Disturbance in Habitat within Analysis Area (acres)	Functional Habitat Disturbed in Analysis Area (%)	Proposed Action Contribution to Disturbed Habitat (acres)	Total Existing and New Disturbed Habitat (acres)	Total Existing and New Disturbed Habitat (%)
Very Good	6,953.47	3,980.32	57.2%	25.26	4,005.58	57.6%
Good	29,246.93	15,135.92	51.8%	259.06	15,391.98	52.6%
Fair	8,215.52	3,335.52	40.6%	0	3,335.52	40.6
Poor	4,088.84	889.37	21.8%	0	889.37	21.8%
Total	**48,504.76**	**23,341.13**	**48.1%**	**284.32**	**23,625.45**	**48.7%**

The area has been highly impacted by development which has human presence throughout the analysis area. Additionally, the Milford Flat fire has dramatically altered the vegetation in the area. These

cumulative impacts will have a long-term influence and contribute to limiting kit fox populations utilizing the area.

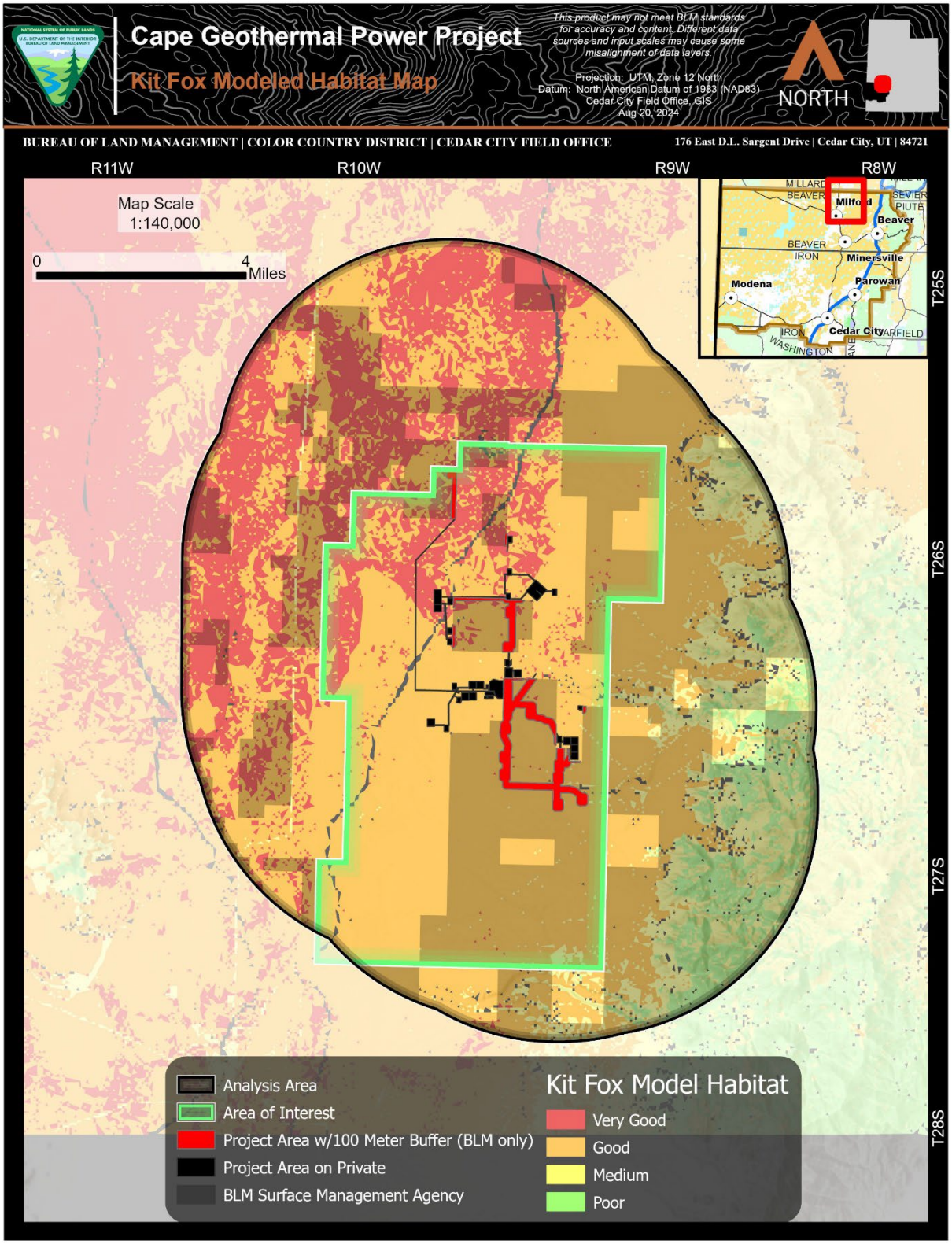

Figure 3-5a. Kit Fox Modeled Habitat Map (Project Area).

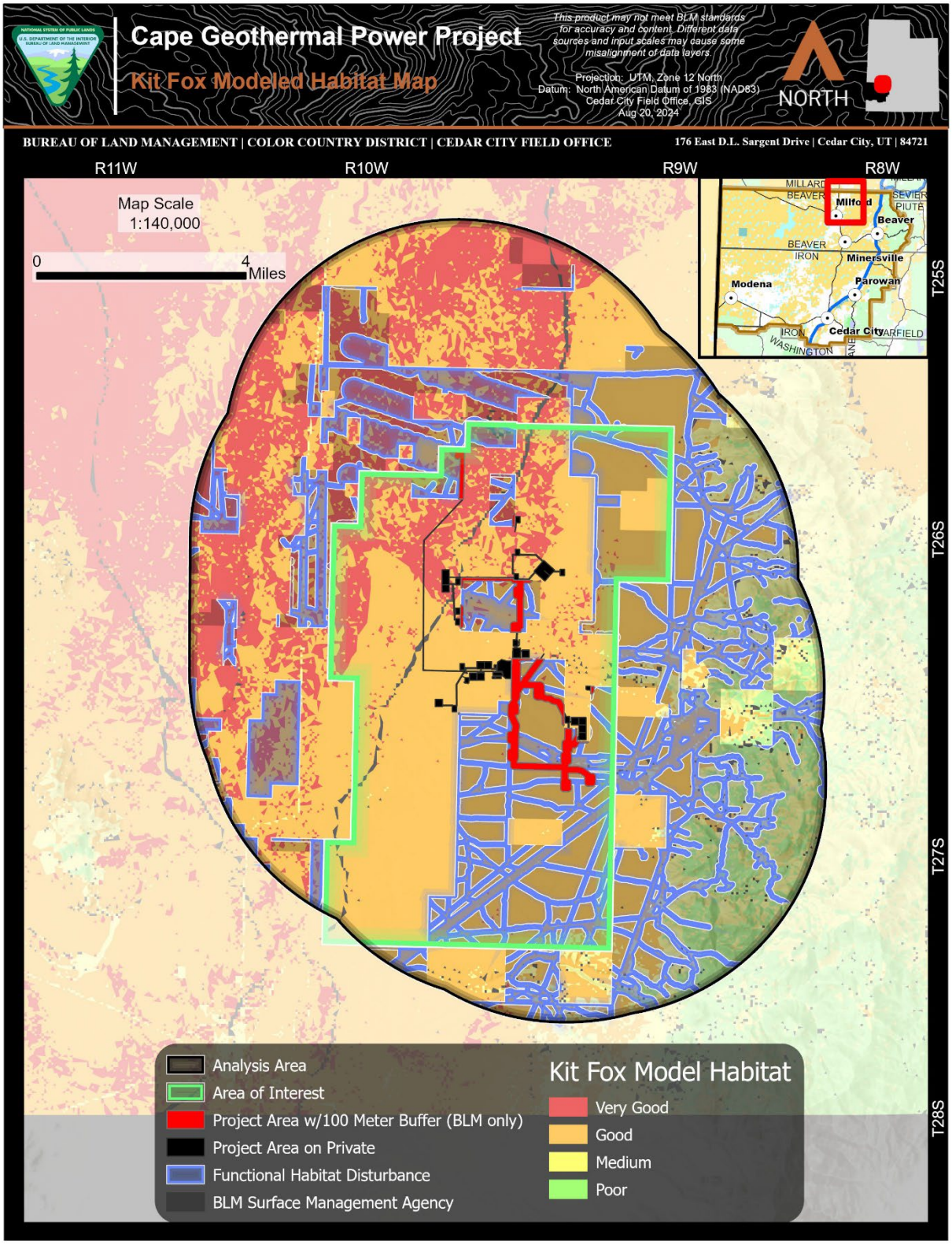

Figure 3-5b. Kit Fox Modeled Habitat Map (Cumulative Disturbance).

CHAPTER 4.0. CONSULTATION AND COORDINATION

This chapter identifies agencies or other organizations that were consulted in the preparation of this EA document. This chapter also summarizes the public participation process as required by Section 106 and by NEPA (40 CFR 1501.9).

4.1. SUMMARY OF CONSULTATION AND COORDINATION

This section summarizes the consultations that occurred with other agencies (Federal, State, or local) either by the BLM or by the third-party NEPA contractor.

4.1.1. Agencies and Organizations Consulted

Table 4-1 lists the agencies and organizations consulted during the preparation of this EA. Copies of the agency consultation letters, and any responses are included in **Appendix E**.

Table 4-1. List of Agencies and Organizations Consulted

Name	Purpose and/or Authorities for Consultation or Coordination	Findings and Conclusions
Consultation performed by Groundwater & Environmental Services, Inc.		
Beaver County	Consultation with the Planning & Zoning Department for Beaver County, Utah.	The proposed project would not impact flight patterns at the Milford Municipal Airport as the project area is outside the Primary Runway Approach Zone and Transitional Zone.
Federal Aviation Administration (FAA)	49 U.S.C. 106. Code of Federal Regulations (CFR) Title 14, Chapter I, Part 77 – Safe, Efficient Use, and Preservation of the Navigable Airspace.	The requirements for filing with the FAA for proposed structures (or equipment) vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc. The FAA Notice Criteria Tool indicates the proposed project does not exceed notice criteria.
UDWRi Stream Alteration Program	Utah Code Section 73-3-29.	Based upon the UDWRi review of relevant information, UDWRi has determined that there are no watercourses within the project area that meet the State Engineer's definition of a natural stream. As such, no state stream alteration permits would be required for alteration to these channels.

Name	Purpose and/or Authorities for Consultation or Coordination	Findings and Conclusions
UDWR and Utah Public Lands Policy Coordinating Office (UPLPCO)	Consultation with the wildlife and public lands authority for Utah.	An Early Coordination Review of the proposed project was initiated with the UDWR in November, 2023. A response from the UPLPCO, in collaboration with UDWR, was received on April 29, 2024. Comments received included the following: • UDWR appreciates Fervo's consideration of wildlife and habitat on private lands. • The project area is outside the greater sage-grouse habitat or management areas. • Wildlife should not move into the project area once construction has begun; however, if wildlife are identified, personnel should keep a reasonable distance and wildlife should move from the area. If injured wildlife are observed, contact UDWR. • UDWR noted pronghorn use within the project area and contributing to a water development and shrub enhancement project to mitigate for potential impacts to pronghorn. • UDWR noted recommendations for exclusionary fencing and escape ramps for small wildlife for reserve pits and trenches. • UDWR recommended considering avian species when developing transmission lines to reduce avian injury and mortality. • Kit fox dens occupied by pups should be avoided during pup-rearing from February 1- July 30. If construction activities occur during pup-rearing, surveys are recommended. If active kit fox dens are found, artificial burrows can be used to encourage them away from project-related activities. • If burrowing owls are found onsite, construction should be avoided within 0.25 miles of their burrow from March 15 - August 15. • UDWR recommends all trenching for pipelines occur with concurrent backfilling, or that escape ramps be placed within any open pits during construction. If the pipeline cannot be buried and is elevated, sufficient clearance should be considered to allow adequate passage for pronghorn and other wildlife.
Consultation Performed by the Bureau of Land Management		

Name	Purpose and/or Authorities for Consultation or Coordination	Findings and Conclusions
Utah SHPO	Consultation as required by the NHPA (Public Law 89-665; 54 USC 300101 et seq.)	Consultation pursuant to Section 106 was initiated on July 1, 2024. Concurrence on the use of a phased approach with the commitment to maintain the finding of effect to "No Adverse" was received from SHPO on July 15, 2024.
Hopi Tribe	Government-to-government consultation as required by the American Indian Religious Freedom Act of 1978 (42 USC 1531), the Native American Graves Protection and Repatriation Act (25 USC 3001 et seq), and the NHPA (Public Law 89-665; 54 USC 300101 et seq.).	A notification letter was sent to the Hopi Tribe on July 2, 2024. Consultation is on-going.
Kaibab Band of Paiute Indians	Government-to-government consultation as required by the American Indian Religious Freedom Act of 1978 (42 USC 1531), the Native American Graves Protection and Repatriation Act (25 USC 3001 et seq), and the NHPA (Public Law 89-665; 54 USC 300101 et seq.).	A notification letter was sent to the Kaibab Band of Paiute Indians on July 2, 2024. Consultation is on-going.
Moapa Band of Paiute Indians	Government-to-government consultation as required by the American Indian Religious Freedom Act of 1978 (42 USC 1531), the Native American Graves Protection and Repatriation Act (25 USC 3001 et seq), and the NHPA (Public Law 89-665; 54 USC 300101 et seq.).	A notification letter was sent to the Moapa Band of Paiute Indians on July 2 and July 3, 2024. Consultation is on-going.
Paiute Indian Tribe of Utah	Government-to-government consultation as required by the American Indian Religious Freedom Act of 1978 (42 USC 1531), the Native American Graves Protection and Repatriation Act (25 USC 3001 et seq), and the NHPA (Public Law 89-665; 54 USC 300101 et seq.).	A notification letter was sent to the Paiute Indian Tribe of Utah on July 2 and July 3, 2024. Consultation is on-going.
Ute Indian Tribe	Government-to-government consultation as required by the American Indian Religious Freedom Act of 1978 (42 USC 1531), the Native American Graves Protection and Repatriation Act (25 USC 3001 et seq), and the NHPA (Public Law 89-665; 54 USC 300101 et seq.).	A notification letter was sent to the Ute Indian Tribe on July 2, 2024. Consultation is on-going.

Name	Purpose and/or Authorities for Consultation or Coordination	Findings and Conclusions
Ute Mountain Ute Tribe	Government-to-government consultation as required by the American Indian Religious Freedom Act of 1978 (42 USC 1531), the Native American Graves Protection and Repatriation Act (25 USC 3001 et seq), and the NHPA (Public Law 89-665; 54 USC 300101 et seq.).	A notification letter was sent to the Ute Mountain Ute Tribe on July 2, 2024. Consultation is on-going.
Pueblo of Zuni	Government-to-government consultation as required by the American Indian Religious Freedom Act of 1978 (42 USC 1531), the Native American Graves Protection and Repatriation Act (25 USC 3001 et seq), and the NHPA (Public Law 89-665; 54 USC 300101 et seq.).	A notification letter was sent to the Pueblo of Zuni on July 2, 2024. Consultation is on-going.
Navajo Nation	Government-to-government consultation as required by the American Indian Religious Freedom Act of 1978 (42 USC 1531), the Native American Graves Protection and Repatriation Act (25 USC 3001 et seq), and the NHPA (Public Law 89-665; 54 USC 300101 et seq.).	A notification letter was sent to the Navajo Nation on July 2, 2024. Consultation is on-going.

4.2. SUMMARY OF PUBLIC PARTICIPATION

The BLM conducted internal scoping on the Proposed Action and completed an ID Team Checklist in June 2024. Issues identified by the ID Team were incorporated into this EA for analysis (Chapter 3).

During the preparation of the EA, the public was notified of the Proposed Action through a posting on the BLM's ePlanning website on June 04, 2024. The BLM provided a 30-day public review and comment period for the draft EA, beginning on August 21, 2024, and ending on September 20, 2024. Copies of the draft EA were available on the BLM's ePlanning website during the public review and comment period.

4.2.1. Public Comments Analysis

The public comments and responses to substantive comments will be included in **Appendix F** of the Final EA.

4.3. LIST OF PREPARERS

BLM staff specialists who determined the potentially affected resources for this document, and those BLM staff who assisted in the preparation and drafting of this EA are listed in the ID Team Checklist in **Appendix C**. Members of the third-party NEPA contractor, GES, who contributed to the preparation of this EA and provided review comments on the EA are listed in **Table 4-2**.

Table 4-2. Groundwater & Environmental Services, Inc. - Environmental Consultants Preparers and Reviewers

Name	Title	Responsibility
Joseph Schwartz, CWB	Project Manager	Project Management, Document Preparation and Review
Madison Peters, WPIT	NEPA Specialist	Document Preparation and Biological Surveys
Ethan Whitington	NEPA Specialist	Biological Surveys

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APPENDIX A

Plan of Operations

PLAN OF OPERATIONS

(43 CFR SUBPART 3250-3270)

CAPE GEOTHERMAL POWER PROJECT

FEDERAL GEOTHERMAL LEASES:
UTU-95314
UTU-95315
UTU-95318
UTU-105294998
UTU-105294999
UTU-105295000

BEAVER COUNTY, UTAH

AUGUST 2024

APPLICANT:

FEC E&P MANAGEMENT LLC and ESCALANTE DESERT RESOURCES LLC
910 LOUISIANA STREET, SUITE 4400
HOUSTON, TEXAS 77002

CAPE GEOTHERMAL POWER PROJECT
FEC E&P MANAGEMENT LLC and ESCALANTE DESERT RESOURCES LLC
PLAN OF OPERATIONS

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ACRONYMS AND ABBREVIATIONS

AC	Acres
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
AOI	Area of Interest
APLIC	Avian Power Line Interaction Committee
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
BHP	Brake Horsepower
BLM	US Department of the Interior, Bureau of Land Management
BMP	Best Management Practice
CFR	Code of Federal Regulations
CO2	Carbon Dioxide
COD	Commercial Operations Date
DAC	Direct Air Capture
DBA	Decibel
DOI	US Department of the Interior
DWMRC	UDEQ, Division of Waste Management and Radiation Control
E	East
EA	Environmental Assessment
ECD	Erosional Control Devices
EDR	FEC E&P Management LLC and Escalante Desert Resources LLC (the applicant)
EGS	Enhanced Geothermal System
EPA	US Environmental Protection Agency
EST	Estimate
Exploration EA	Cape Modern Geothermal Exploration Project Environmental Assessment, DOI-BLM-UT-C010-2023-0004-EA, recipient of a FONSI on February 13, 2023
FEC	Fervo Energy Company
FONSI	Finding of No Significant Impact
G	Grams
GDP	Geothermal Drilling Permit, Bureau of Land Management Form 3260-2
GPM	Gallons Per Minute
H2S	Hydrogen Sulfide
HR	Hour
IBC	International Building Code
ICC	International Code Council
ID	Identification
IEEE	Institute of Electrical and Electronics Engineers
KG	Kilograms

LED	Light-Emitting Diode
LGIA	Large Generator Interconnection Agreement
LIDAR	Light Detection and Ranging
LLC	Limited Liability Corporation
M	Meters
MD	Measured Depth
MT	Magnetotelluric Survey
MVA	Megavolt Ampere
MW	Megawatt (one million watts)
N	North
NAD83	North American Datum of 1983
NCG	Non-Condensable Gas
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NESC	National Electrical Safety Code
NFPA	National Fire Protection Association
NORM	Naturally Occurring Radioactive Materials
NOx	Nitrogen Oxides
OEM	Original Equipment Manufacturer
ORC	Organic Rankine Cycle
OSHA	US Department of Labor, Occupational Safety and Health Administration
OTR	Over-the-Road
pH	International standard scale indicating acidity or basicity of aqueous solutions
PIP	Process Industry Practices
POO	Plan of Operations
PPA	Power Purchase Agreement
Project	Cape Geothermal Power Project
R	Range
ROW	Right of Way
S	South, Section, or Second
SITLA	Utah State Institutional Trust Lands Authority
SOV	Surface Orbital Vibrator
SPCC	Spill Prevention Control and Countermeasure
ST	Street
SUAS	Small Unmanned Aerial System
SWPPP	Stormwater Pollution Prevention Plan
SWUPHD	Southwest Utah Public Health Department
T	Township
TDS	Total Dissolved Solids
TEG	Triethylene Glycol
TSA	Transmission Service Agreement

TVD	True Vertical Depth
TDEM	Time-Domain Electromagnetic
UDAQ	Utah Department of Environmental Quality, Division of Air Quality
UDEQ	Utah Department of Environmental Quality
UDWQ	Utah Department of Environmental Quality, Division of Water Quality
UDNR	Utah Department of Natural Resources
UDWR	Utah Department of Natural Resources, Division of Wildlife Resources
UDWRi	Utah Department of Natural Resources, Division of Water Rights
U/L	Underwriters Laboratories, standard US electrical equipment certification
UPDES	Utah Pollutant Discharge Elimination System
US	United States
USHPO	Utah State Historic Preservation Office
UT	Utah
UTM	Universal Transverse Mercator
VFD	Variable Frequency Drive
VRM	Visual Resource Management
W	West
WGS	World Geodetic System

1.0. PROJECT DESCRIPTION

1.1. Introduction

FEC E&P Management LLC and Escalante Desert Resources LLC (together known as EDR), have prepared this Plan of Operations (POO) proposing to construct, operate, and maintain the Cape Geothermal Power Project (known as the 'Project') in Beaver County, Utah (**Figure 1**).

This Project is proposed as the next development step following the previously-submitted Cape Modern Geothermal Exploration Project Environmental Assessment, ID number DOI-BLM-UT-C010-2023-0004-EA (hereafter referred to as the 'Exploration EA'), which received a Finding of No Significant Impact (FONSI) on February 13, 2023. Geothermal exploration work under the Exploration EA began in June 2023, resulting in the construction of well pads, water storage impoundments, and access roads. From these well pads, one vertical observation well and several horizontal wells have been drilled, which have been used to verify that the geothermal resource is viable for production of up to 2,000 MW of renewable electricity via EDR's Enhanced Geothermal System (EGS).

The Project includes the development of an estimated 23 well pads for drilling and completion of geothermal observation, production, and injection wells, up to 20 geothermal power plants, associated access roads, a power distribution network composed of sub-transmission lines, an electrical switchyard, a general tie-in transmission line, geothermal fluid pipeline gathering system, and ancillary facilities such as buildings and required tie-in upgrades.

The developments proposed as part of the Project would be located on private lands, lands owned by Utah's State Institutional Trust Lands Authority (SITLA), and on federal public lands managed by the Bureau of Land Management (BLM) - all proposed developments would be located on areas under geothermal resource lease (**Figure 2, Tables 1.1** and **1.2**).

1.2. Proponents Purpose and Need for the Project

The purpose and need for the Project is to generate and provide reliable, renewable electricity. While solar, wind, and other green energy projects have made great strides in transitioning the US electric grid toward a fully-renewable state, making carbon-free electricity available 24/7 and on-demand is a critical next-step in the green energy transition, requiring so-called "clean, firm" energy sources. The Cape Geothermal Power Project can be one such "clean, firm" renewable energy source - with EDR's built, tested, and proven proprietary EGS technology system, the Project could yield development of up 2,000 MW of 24/7 clean, firm, renewable power, which could lead to significant positive benefits to the environment and local economy.

To-date, EDR has executed 12 separate Power Purchase Agreements (PPAs) for a total of 373 MW of dedicated capacity from the Project. The PPAs were executed between 2022 and 2023, with off-takers consisting of community choice aggregators and a large investor-owned utility. The earliest phase of the project has a target Commercial Operations Date (COD) of summer 2026; PPAs for additional capacity beyond 373 MW are currently being evaluated.

The need for the Project is also established by the BLM's responsibility under the Mineral Leasing Act of 1920 e. seq., the Geothermal Steam Act of 1970 et al., as amended by the Energy

Policy Act of 2005 and Secretarial Order 3285 (Renewable Energy Development by the Department of the Interior), and the implementing regulations provided under 43 CFR 3200. The need for action is also established by the BLM's responsibility to process a Right of Way (ROW) application under the Federal Land Policy and Management Act of 1976 (FLPMA) and ROW procedures at 43 CFR 2800.

1.3. General Facility Description, Design, and Operation

1.3.1. Project Location, Land Ownership, and Jurisdiction

The Project Area of Interest (AOI) is entirely encompassed within a Federal Exploration Unit. The unit was designated via letter signed by Christina Price, BLM Utah State Office Deputy State Director of Lands and Minerals, on June 27, 2024. This Unit Agreement, as defined by 43 CFR Section 3280.2, is an agreement for the exploration, development, production, and utilization of multiple geothermal resource leases made subject to a single consolidated development unit that operates as a single lease across multiple separate ownerships. Unitization provides for the allocation of costs and benefits across the Unit. The Cape Geothermal Power Project Unit includes federal, state and private property, and is located in Beaver and Millard Counties, in the State of Utah.

All geothermal wells proposed as part of the Project would be located within the AOI, either within federal geothermal leases on public lands managed by the BLM or privately-held geothermal leases on private land, though wells may be relocated to other federal, state, and private property within the AOI as new leasing arrangements are finalized and as the geothermal resource continues to be explored. Relocations within federal property on the AOI will be pre-surveyed to avoid additional impacts to biological or cultural resources, and will be subject to BLM sundry notice and approval. All geothermal leases currently secured within this AOI are defined in **Tables 1.1** and **1.2** below.

Some areas within the AOI have geothermal leases which are currently pending, or are un-leased by EDR - these areas are not reflected in **Tables 1.1** and **1.2** below, and no surface or underground development will take place in these areas until and unless leases for these areas are secured.

Table 1.1: Federal Geothermal Leases within the AOI

Lease Number	Gross Acreage in AOI
UTU-95314	3,301.64
UTU-95318	2,920.00
UTU-95315	2,560.00
UTU-105294998	2,640.00
UTU-105294999	1,640.00
UTU-105295000	920.00
Total Gross Acres	**13,981.64**

Table 1.2: Private Geothermal Leases within the AOI

Lease Name	Gross Acreage in AOI
UT_Cape_Armstrong	649.11
UT_Cape_Wright	330.50
UT_Cape_Machris	320.00
UT_Cape_Smithfield	9,699.83
UT_Cape_Hilton*	*Split Minerals under Smithfield
UT_Cape_XTO*	*Un-leased Split Minerals under Smithfield
UT_Cape_Yardley	3,680.00
UT_Cape_Keller	320.00
UT_Cape_Rule	40.00
Total Gross Acres	**15,039.44**

1.3.2. Acreage and General Dimensions

The total Project layout is shown on the Project Overview Map on **Figure 4**. The maximum surface disturbance associated with the Project during construction would be 631.32 acres, approximately 1.8% of the total AOI. Total estimated disturbance areas to construct each project component are shown in **Table 1.3** below. Though approximately half of the intended underground production areas of the geothermal resource are federally-owned, of the maximum surface disturbance, approximately 155 acres (~25% of the total Project maximum surface disturbance) are anticipated to be located on federal property under the current development plan, and will be composed of well pads, access roads, sub-transmission lines, a transmission line, and pipelines. The remaining approximately 476 acres (~75% of the total Project maximum surface disturbance) are planned to be located on private property, and will include all power plants and the switchyard, as well as additional well pads, access roads, sub-transmission lines, a transmission line, and pipelines. Under the current development plan, this represents a probable increase of approximately 90 acres of impact to federal lands beyond the 65.1 acres already impacted under the previously-approved Exploration EA, as-described below.

Once construction is complete, some disturbed areas not converted to permanent operation use such as laydown yards, staging areas, and sub-transmission / transmission / geothermal fluid pipeline construction corridors will be reclaimed as-stipulated in Section 5. The long-term operational disturbance of the Project is estimated to be lower than the short-term construction disturbance, as-shown in **Table 1.3** below. Operational long-term disturbance areas are roughly-estimated, therefore disturbance areas calculated in subsequent sections of the POO assume the larger, short-term construction disturbance areas.

Of the maximum surface disturbance, 65.1 acres (~10.3% of the total Project maximum surface disturbance) has already been built under the previously-approved Exploration EA, and consists of five well pads, two water storage impoundments, and associated access roads, located on both BLM and private property. These disturbed areas will be repurposed for Project operational use, and are included in **Table 1.3** below.

Table 1.3: Estimated Surface Disturbance by Category and Maximum Total

Type of Project Surface Disturbance	Estimated Short-Term Construction Surface Disturbance (ac)	Estimated Long-Term Operational Surface Disturbance (ac)
Built Well Pads	35.86	35.86
Planned Well Pads & Water Storage Impoundments	120.87	120.87
Built Water Storage Impoundments	10.67	0.00
Well Pad Subtotal:	**167.40**	**156.73**
Built Access Roads	18.55	18.55
Planned Access Roads	38.99	38.99
Access Road Subtotal:	**57.54**	**57.54**
Designed Power Plants	70.39	28.39
Planned Power Plants	219.69	161.50
Power Plant Subtotal:	**290.08**	**189.89**
Switchyard	10.00	10.00
Transmission Line & Maintenance Road	43.97	7.42
Sub-Transmission Lines & Maintenance Roads	30.39	7.70
Transmission Subtotal:	**84.39**	**25.12**
Geothermal Fluid Pipelines & Maintenance Roads	31.91	11.97
Pipeline Subtotal:	**31.91**	**11.97**
Maximum Total Project Surface Disturbance:	**631.32**	**441.25**

1.3.3. Geothermal Well Field

Based on positive results from EDR's geothermal exploration drilling to-date, EDR plans to drill an estimated 320 geothermal injection and production wells within the AOI from approximately 20 pad locations (**Figures 3** and **4, Table 2**). EDR's development strategy involves drilling multiple horizontal injection and production wells to recover the geothermal resource with maximum efficiency and with minimal surface impact to the environment. In addition to the horizontal wells, the wellfield development plan requires drilling several vertical observation wells for the purposes of measuring the formation temperature, verifying the lithologic structure of the formation, and potentially hosting data acquisition systems such as fiber optic cables or temporary downhole geophones; 3 additional well pads are currently designed for vertical observation wells, though additional observation wells may be drilled from other pads. Observation wells may also be drilled in non-vertical geometries, such as S-curve or slant well geometries. These injection, production, and observation wells will be constructed in-concert with the geothermal power plants in a phased approach.

It should be noted that the number of well pads and associated well pad surface impacts required to drill sufficient wells for 373 delivered MW of geothermal energy production to meet current PPA commercial obligations has been substantially reduced from the twenty-nine well pads assessed in the previously-approved Exploration EA; the previously-approved twenty-nine well pads were originally estimated to be required to generate 150 MW. This 2½-fold increase in potential electrical production per acre of well pad disturbance has been

achieved via increased density in directional wells drilled per-pad, as well as strategic development of the geothermal resource.

The target well pad locations identified in **Table 2** below may be relocated to other federal, state, or private property within the AOI as new leasing arrangements are finalized and as the geothermal resource continues to be explored. Relocations within federal property on the AOI will be pre-surveyed to avoid additional impacts to biological or cultural resources, and will be subject to BLM sundry notice and approval.

Table 2: Cape Well Pad Target Sites

Well Pad No	Lease Type (Federal v State v Private)	Status	Pad Name	Lease No	Legal Description	Lat WGS 84	Long WGS 84	Acres (Est.)
1	Private	Built	Bearskin	Smithfield	S31 T26S R9W	38.51050°N	112.91538°W	6.540
2	BLM	Built	Gold	UTU-095314	S36 T26S R10W	38.50259°N	112.91819°W	7.087
3	BLM	Built	Frisco	UTU-095314	S1 T27S R10W	38.49521°N	112.91815°W	8.472
4	BLM	Built	Delano	UTU-095314	S6 T27S R9W	38.49672°N	112.90509°W	8.074
5	BLM	Planned	Belknap	UTU-095314	S1 T27S R10W	38.49089°N	112.91826°W	6.715
6	BLM	Planned	Granite	UTU-095314	S12 T27S R10W	38.48277°N	112.91842°W	6.715
7	BLM	Built	Winkler	UTU-095314	S12 T27S R10W	38.47781°N	112.91826°W	5.682
8	Private	Planned	TBD	Smithfield	S26 T26S R10W	38.52794°N	112.93664°W	6.715
9	Private	Planned	TBD	Smithfield	S26 T26S R10W	38.51978°N	112.93642°W	6.715
10	Private	Planned	TBD	Smithfield	S19 T26S R9W	38.53109°N	112.89985°W	6.715
11	Private	Planned	TBD	Smithfield	S19 T26S R9W	38.53641°N	112.91585°W	6.715
12	Private	Planned	TBD	Smithfield	S19 T26S R9W	38.52960°N	112.91608°W	6.715
13	BLM	Planned	TBD	UTUT105295000	S30 T26S R9W	38.52532°N	112.91518°W	6.715
14	Private	Planned	TBD	Smithfield	S26 T26S R10W	38.51684°N	112.93642°W	6.715
15	BLM	Planned	TBD	UTUT105295000	S30 T26S R9W	38.51542°N	112.91590°W	6.715
16	Private	Planned	TBD	Machris	S36 T26S R10W	38.50444°N	112.93450°W	6.715
17	Private	Planned	TBD	Smithfield	S2 T27S R10W	38.49278°N	112.93696°W	6.715
18	Private	Planned	TBD	Smithfield	S5 T27S R9W	38.49036°N	112.89700°W	6.715
19	BLM	Planned	Signal	UTU-095314	T8 T27S R9W	38.48299°N	112.89685°W	6.715
20	BLM	Planned	TBD	UTU-095314	T8 T27S R9W	38.47969°N	112.89718°W	6.715
21	BLM	Planned	TBD	UTU-095314	T8 T27S R9W	38.47224°N	112.89706°W	6.715
22	Private	Planned	TBD	Smithfield	S18 T26S R9W	38.54545°N	112.91597°W	6.715
23	BLM	Planned	TBD	UTU-095314	S8 T27S R9W	38.47390°N	112.88856°W	6.715

1.3.4. Power Plant Facilities

Up to 20 binary geothermal energy plants are proposed to be constructed within the AOI (**Figure 4** and **Table 3**). During power generation, treated groundwater (hereafter referred to as 'geothermal fluid') is cycled through an underground Enhanced Geothermal System (EGS) to extract heat from the reservoir, which is then cycled through the binary plants. This process is described in greater detail in Section 1.3.7.

During the initial phase of power plant construction, EDR will construct three Organic Rankine

Cycle (ORC) power generation units, which utilize a "low boiling point" fluid (typically a hydrocarbon) as their working fluid. The working fluid is heated by the geothermal fluid via shell and tube heat exchangers, and will be composed of pentane or a similar fluid in a closed loop system, as well as lubrication oil on all rotating equipment. Noise and lighting will be minimized and conform to professional standards and jurisdictional regulatory requirements.

During subsequent phases of power plant construction, EDR will construct up to 17 additional power generation stations. Power plant design for subsequent phases is still in evaluation, and will use either ORC power generation systems established in the initial phase, or other similar systems. As in the initial phase, no substantive air emissions are planned during operation of the power plants brought on-line in subsequent phases. Power plants constructed in the initial phase will be used to inform the design and specifications of the power plants constructed in subsequent phases, which are anticipated to require a smaller footprint than those units constructed during the initial phase by limiting / combining laydown yards and more efficiently-used footprints of disturbance.

The target locations identified in **Table 3** below may be relocated to other state or private property within the AOI as new leasing arrangements are finalized and as the geothermal resource continues to be explored. No power plant will be placed on BLM property.

Table 3: Cape Power Plant & Lay Down Target Sites

Power Plant Unit No	Lease Type (Federal v State v Private)	Status	Legal Description	Lat WGS 84	Long WGS 84	Acres (Est, incl. Temporary Lay Downs)
1	Private	Designed	T.26S., R.09W., S31	38.50910°N	112.91524°W	18.03
2	Private	Designed	T.26S., R.10W., S36	38.50431°N	112.91888°W	26.26
3	Private	Designed	T.26S., R.10W., S36	38.50244°N	112.91884°W	26.10
4	Private	Planned	T.26S., R.10W., S23	38.53012°N	112.94103°W	12.92
5	Private	Planned	T.26S., R.10W., S28	38.52807°N	112.94097°W	12.92
6	Private	Planned	T.26S., R.10W., S28	38.52600°N	112.94092°W	12.92
7	Private	Planned	T.26S., R.09W., S19	38.53292°N	112.90638°W	12.92
8	Private	Planned	T.26S., R.09W., S19	38.53159°N	112.90438°W	12.92
9	Private	Planned	T.26S., R.09W., S19	38.53135°N	112.90808°W	12.92
10	Private	Planned	T.26S., R.09W., S19	38.53002°N	112.90610°W	12.92
11	Private	Planned	T.26S., R.10W., S36	38.50492°N	112.92803°W	12.92
12	Private	Planned	T.26S., R.09W., S31	38.50839°N	112.91223°W	12.92
13	Private	Planned	T.26S., R.10W., S36	38.50497°N	112.92540°W	12.92
14	Private	Planned	T.26S., R.10W., S36	38.50175°N	112.93057°W	12.92
15	Private	Planned	T.26S., R.10W., S36	38.50181°N	112.92794°W	12.92
16	Private	Planned	T.27S., R.10W., S02	38.49425°N	112.94246°W	12.92
17	Private	Planned	T.27S., R.09W., S05	38.48590°N	112.89155°W	12.92
18	Private	Planned	T.27S., R.09W., S05	38.48797°N	112.89160°W	12.92
19	Private	Planned	T.27S., R.09W., S05	38.49004°N	112.89167°W	12.92
20	Private	Planned	T.27S., R.09W., S05	38.48999°N	112.89430°W	12.92

1.3.5. Lay Down and Staging Areas

EDR would employ temporary laydown yards around the power plant construction sites that would be utilized for offloading of materials and preinstallation equipment storage. Where possible, EDR will use existing disturbed areas to site laydown yards. Laydown yards will be located adjacent to power plants on private property. These laydown yards would utilize minimal surface disturbance and will be available for full reclamation after the construction period. Some laydown yards may be converted for permanent use if required for ongoing power generation operations.

1.3.6. Interconnection to Electrical Grid

A single 362 kV transmission line and a network of 69 kV or similar sub-transmission lines are proposed to be constructed to connect the Project to the electrical grid **(Figures 4** and **8)**. The sub-transmission lines would connect power plant facilities to the well pads and a central switchyard, the switchyard to be constructed on private property at approximately 38.50447°N, 112.92121°W. The switchyard would be used to step up the low voltage electrical energy generated at the power plants to the higher voltage required for transmission, and would encompass a roughly 10-acre area.

An approximately 6-mile, 362 kV transmission line will connect from the central switchyard to the existing Milford substation, located at 38.56220°N, 112.93828°W. The 362 kV transmission line structures will be galvanized steel or similar structures. Tangents will be direct-embedded H-Frame or similar structures using crushed rock backfill. Deadends will be 3-pole or similar structures and will be supported by a concrete drilled shaft foundation. A ROW agreement will be required for the approximately 2,400-ft portion of the power transmission corridor crossing BLM property outside the BLM lease area to the Milford Substation. A SF-299 form will be submitted for this ROW.

The 69 kV sub-transmission structures will also be galvanized steel or similar structures. Tangents and deadends will both be direct embed monopoles with crushed rock backfill. Deadends will require the use of guys and anchors to support the structure. Alternatively, some sections of sub-transmission lines may also be buried or placed in cable trays. Buried sub-transmission lines would be placed in a narrow trench in armored cable or conduit, and labeled with visible markings at ground surface. Buried or cable-tray sub-transmission lines would be sited along corridors pre-surveyed to avoid additional impacts to biological or cultural resources, and would be placed parallel to access roads or other planned disturbance corridors to avoid increased surface disturbance.

Transmission and overhead sub-transmission lines will be constructed per Avian Power Line Interaction Committee (APLIC) recommendations and/or Avian Protection Plan Guidelines to minimize electrocutions and collisions. Guyed structures will be equipped with avian/bat diverters at sufficient intervals to minimize the potential for impacts associated with bird/bat strikes. Perch deterrents may be utilized to reduce avian predation and would be approved by the BLM Authorized Officer.

1.3.7. Geothermal Fluid System and Pipelines

Heat will be extracted from the underground geothermal resource using geothermal fluid, cycled through the wells and power plants via pipelines. The geothermal fluid circuit will be entirely closed-loop at the surface, transmitting heated fluid from the underground resource via the producer wells, through the power plants' heat exchange system, and reinjecting the cooled fluid back to the underground resource via the injector wells. The closed-loop surface system will prevent geothermal fluid from exposure to the surface environment. Minimal loss of geothermal fluid within the underground geothermal resource is expected, as evidenced by previous pilots and exploration well testing. The geothermal fluid will be pumped into the resource from the surface using injection pumps. The pumps will be sized to reduce the quantity of pumps, parasitic load, and delivery of required fluid to the resource over its expected operating life. After passing through the geothermal resource, the geothermal fluid will return to the surface via production wells. In some cases, the production wells may be operated with artificial lift methods, such as line shaft pumps or electric submersible pumps. Each well pad will have a number of injection and/or production wells, depending on surface layout requirements and reservoir modeling results of the resource.

Carbon steel or similar pipelines will deliver the geothermal fluid to and from the power plants, pumps, and well heads. Pipelines may be placed above-ground on conventional pipe stands, or below-ground in prepared trenches. Heat loss from piping due to convection and radiation would be minimized where appropriate with pipe insulation. Expansion joints will be placed at regular intervals to accommodate pipe growth due to thermal expansion and contraction. The piping system will be equipped with pressure, temperature, and flow measurement devices to facilitate optimum compliance, operation, and troubleshooting if required. Pipe shoes will be used at all connections to mechanical bents. The piping system will undergo a stress analysis to determine anchor points and spring settings to accommodate expansion and surge.

EDR is pursuing potential options for burying geothermal fluid pipelines. Burying geothermal fluid pipelines have several potential benefits, including limiting visual impact and minimizing permanent surface disturbance. EDR will pursue all relevant state permitting required prior to installation of such a system.

1.3.8. Ancillary Facilities

EDR would construct a small control building with adjoining workshop on private land for long term operations of the power plants and geothermal fluid system. The building would have sanitary facilities for employees with a septic system that meets state and local permitting requirements. The parking lot would be small, and have one paved handicap accessible space in accordance with building code requirements. All applicable state and county permits will be secured prior to construction.

There may be additional ancillary facilities added to the geothermal production system, depending on technological advances and opportunities. Such ancillary facilities may include direct air carbon capture, green houses, or heat offtake gathering and condensing systems, as well as other technologies unknown or unanticipated at this time; any such additional

technologies and jurisdictional changes on federal property will be subject to BLM sundry notice and approval. Any such additions would not increase the surface impacts from geothermal operations proposed in this POO and would be permitted as required by local, state and federal regulation.

1.4. Federal, State, and Local Agency Permit Requirements

The following permits may be required, and where necessary, will be secured prior to construction and/or operations of each Project component. Permit requirements are shown in **Table 4** below.

Table 4: Identified Federal, State, and Local Agency Permits

Cape Modern Project Permits		Permit Acquired / To Be Acquired	Regulatory Agency
Surface Pre-Construction Permitting	County CUP	Conditional Use Permit for Production Approval by Planning & Zoning	Beaver County
		Conditional Use Permit for Production Approval by Commissioners	Beaver County
	SWPPP	UPDES Stormwater Pollution Prevention Plan (SWPPP)	UDWQ
	Wildlife	Biologic Species Survey < 30 days prior to Construction	BLM
	County Building	Power Plant / Transmission / Ancillary Building Permit Approval	Beaver County
	County Roads	Road Maintenance Agreement for Production	Beaver County
		Road Right-of-Way Encroachment Permits for Production (if req)	Beaver County
	ROW	BLM Right of Way Agreement for Transmission Line Corridor to Substation	BLM
Power Generation Pre-Operations Permitting	Commercial	Federal Commercial Use Permit of Geothermal Resources	BLM
	Air Quality	Utah Air Permitting for Emergency Chemical Release (if req)	UDAQ
	Wastewater	Utah Public Health Potable Water Supply / Wastewater Disposal Permitting	SWUPHD
	Underground Injection Control	Underground Injection Control (UIC) Class V Well Inventory	UDWQ
		Appraisal & Confirmation Well Conversion to Class V Injection Wells	UDWRi
		UIC Class V Well Area Permit	UDWRi
	Water Rights	Renewed Temporary Water Right Change Application Approval	UDWRi
		Approval of Non-Consumptive Geothermal Water Use Appropriation	UDWRi

2.0. CONSTRUCTION OF FACILITIES

2.1. Facility Design, Layout, Installation, and Construction Process

Construction of power plants would occur in phases, with the initial phase including construction of power plant units 1, 2, and 3, the central switchyard, and transmission line, as well as associated laydown yards, sub-transmission lines, and a geothermal fluid pipeline system. Production well pads associated with the initial phase of power production have been constructed under the previously-approved Exploration EA, repurposed from their original use as exploration well drilling platforms without additional surface disturbance. Initial civil operations, site clearing, groundbreaking, and foundation preparation work for the power plant units and associated structures would begin upon approval. Civil construction will be conducted in-sequence, with two-to-three construction crews operating simultaneously, to minimize simultaneous surface disturbance.

Initial above-ground construction and assembly work will follow on the three power plant units in sequence, following completion of foundation preparation work. Initial power is scheduled to come on-line in 2026 with start-up of these three power plant units. Construction of subsequent well pads, power plants, sub-transmission lines, and pipelines will immediately follow.

2.2. Site Access and Road Construction

Principal access to the Project area is from Utah State Route 257, approximately four miles north of Milford, Utah, via Geothermal Plant Road to North Antelope Point Road to East Salt Cove Road - all roads leading from Utah State Route 257 to Project entrance roads are owned and maintained by Beaver County. The Project area is traversed by numerous pre-existing smaller roads and "two-tracks." Beaver County roads will not require upgrades, and are currently maintained under a Road Maintenance Agreement between EDR and Beaver County. Some pre-existing smaller roads will also not require upgrade, such as privately-owned two-lane gravel roads. Any un-improved "two-track" roads that are not existing authorized routes would require surface disturbance for improvement. New access roads would require a total of 40 feet width of surface disturbance in order to accommodate a 24-foot-wide drivable roadbed, plus 8 additional feet on either side to facilitate cut and fill requirements, as well as placing or burying power, water, or communications lines (such as fiber optics cable), and stormwater drainage. The width of the roads reflects the anticipated need for safe navigation of the area by large trucks often moving in two-way traffic and carrying oversized loads. New and improved access roads would be constructed using a dozer and/or road grader and would be constructed in succession and "as-needed" to allow access to well pads and power plants. Target construction locations for access roads are identified in **Figure 4**.

The total surface disturbance associated with access road construction within the AOI, assuming a 24-foot-wide drivable roadbed (40-foot wide total width of surface disturbance), would be approximately 57.54 acres (approximately 62,660 linear feet of road x 40-foot-wide surface disturbance). There are many pre-existing roads across the project area, predominantly on private lands, which EDR will use wherever practicable rather than constructing new roads. Of the new access road surface disturbance, approximately 31.21

acres (~54.2% of the total access road surface disturbance) are planned to be located on BLM property. The remaining 26.33 acres (~45.8% of the total access road surface disturbance) are planned to be located on private property. Also, approximately 18.55 acres (~32.2% of the total access road surface disturbance) has already been built under the previously-approved Exploration EA. These existing access roads will be repurposed for Project production use.

Total estimated area of surface disturbance required for improvements to existing two-track roads have been included as new disturbance in the above calculations. This surface disturbance is summarized in **Table 1.3** in Section 1.3.2. In addition, a ROW agreement would be required to construct any "split-estate" access roads to the Project AOI. SF-299 forms would be submitted for such ROWs as-needed.

Aggregate material for access road construction would be obtained from a local source such as the Martin Marietta Milford Quarry, located approximately 6 miles southwest of the Project AOI (see **Table 5**).

Table 5: Potential Aggregate Sources

Aggregate Source Area	Township, Range, Section		Approximate UTM Coordinates (NAD83)	
			Easting (m)	Northing (m)
Martin Marietta Milford Quarry	T.27S, R.10W.	Sec. 20	324970	4258296

Access roads would be covered with approximately four inches of gravel, where necessary, to create an all-weather surface and to prevent the formation of ruts. Total aggregate required for all access road construction is estimated at 18,565 cubic yards (approximately 62,660 linear feet x 24-foot width x 4-inch depth).

Constructed access roads crossing existing drainages may require installation of culverts. Culvert installation would follow BLM design criteria and would be constructed pursuant to standards established in the Gold Book (Fourth Edition - Revised 2007).

2.3. Construction Workforce

2.3.1. Personnel

At its peak, the temporary work force required to construct the initial phase of power plants, switchyard, sub-transmission lines, transmission line, and the geothermal pipeline system is anticipated to be from 175 to 225, adjusted on a rolling monthly basis according to the final construction schedule. Construction of subsequent phases of power generation facilities may require additional personnel.

2.3.2. Vehicles and Equipment

During groundbreaking and foundation preparation work, construction teams would utilize dozers, loaders, blades, excavators, and/or other earthmoving equipment as required. During above-ground construction and assembly, over-the-road (OTR) trucks, cranes, forklifts, civil equipment, and other relevant vehicles may be used.

All vehicles will follow BLM guidelines and requirements as-stated in Section 5.

2.4. Site Preparation

Site preparation would include surveying, staking, geotechnical evaluation, clearing/grubbing, and grading per required drainage plans. All tests that may cause surface disturbance within federal property on the AOI will be pre-surveyed to avoid additional impacts to biologic and cultural resources, and will be subject to BLM sundry notice and approval. Test results will be shared with the BLM or other relevant federal agency as-requested.

2.4.1. Geotechnical Studies, Surveying, and Staking

Geotechnical studies may take place at all major foundation locations, as well as periodically throughout the proposed facility locations to ensure safe/accurate foundation designs. To conduct a geotechnical study, a drill on a rubber-tired OTR truck will be driven overland to the target area, and a small hole will be drilled into the subsurface to analyze the soil conditions. Holes will be back-filled after drilling with cuttings material removed from boring, and target locations will be placed to prevent cultural and ecological disturbance.

Surveying would be performed by a licensed surveyor. Benchmarks would be placed appropriately and staking would be done to ensure consistency between the planned and actual locations.

2.4.2. Vegetation Removal, Clearing, Grading, and Excavation

Well pad and surface facility preparation activities would include clearing, earthwork, drainage, and other improvements necessary for efficient and safe operation and for fire prevention. Only those facilities scheduled to be constructed would be cleared. Clearing would include removal of vegetation, and organic material, stumps, brush, and slash, which would either be removed and taken to an appropriate dump site or left on-site. Topsoil would be stripped (typically to the rooting depth) and either removed to an appropriate dump site or salvaged during the construction, as feasible. Salvaged topsoil (and cleared organic material, stumps, brush, and slash, if saved) would be stockpiled for use during subsequent reclamation. Soil stockpiles that are to be stored for more than 6 months would be stabilized with vegetative cover.

Vegetation removal and habitat alteration would be conducted outside of the primary migratory bird nesting season to the greatest extent possible. If project activities are unavoidable during this time frame, nesting surveys for migratory birds would be conducted by a qualified biologist to ensure no active nests are impacted. Additional biological surveys for BLM-sensitive species (kit fox, burrowing owl, etc.) would be implemented as seasonally-required by the BLM prior to new surface disturbance on federal lands.

Each well pad or surface facility footprint would be prepared and graded to create a level pad. Stormwater runoff from undisturbed areas around the constructed pads would be directed either into a reserve pit, stormwater containment, or back onto undisturbed ground, in a manner consistent with Best Management Practices (BMPs) for stormwater. Stormwater containment structures, where used, will be designed for a 100-year storm. Disturbance boundary erosion mitigation measures, also called Erosional Control Devices (ECDs) may include silt fencing, drainage bars, check dams, berms, and/or seeding.

Reserve pits and stormwater containment structures would be constructed in accordance with BMPs identified in the "Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (Gold Book)" (Fourth Edition – Revised 2007).

A SWPPP would be implemented for the construction activities associated with the Project. The SWPPP would include measures designed to prevent excess sediment from discharging to surface waters in the analysis area.

All eligible concentrations of archeological and/or cultural resources found in the AOI will be avoided entirely. This will be accomplished by relocation of surface disturbance activities. Additionally, fencing and/or construction site monitors will be utilized in situations where construction will be immediately adjacent to eligible sites.

2.5. Geothermal Well Field Construction

2.5.1. Well Field Location

The full well field will be composed of an estimated 20 production pads and 3 observation pads, as-detailed in **Figure 3** and **Table 2**. The target well pad locations may be relocated to other federal, state, or private property within the AOI as new leasing arrangements are finalized and as the geothermal resource continues to be explored. Relocations within federal property on the AOI will be pre-surveyed to avoid additional impacts to biological or cultural resources, and will be subject to BLM sundry notice and approval.

2.5.2. Well Field Construction Material Requirements & Sources

Aggregate material for well pad construction would be obtained from a local source such as the Martin Marietta Milford Quarry (see **Table 5** in Section 2.2).

Well pad locations have been selected to minimize the need for aggregate application, with the majority of the proposed well pads consisting of an approximate even mix of cut and fill to make a stable surface. Each well pad (exclusive of the reserve pit) may be covered with approximately six inches of gravel. While the Project would likely utilize much less, a conservative estimate for the total aggregate required for well pad construction is estimated at 78,154 cubic yards (approximately 3,398 cubic yards per pad x 23 x standard 400 by 600 feet working surface).

2.5.3. Well Field Construction Procedures & Surface Disturbance

Well pads would be constructed incrementally, individually or in small groups, before drilling activity begins. Each well pad would be approximately 400 feet by 600 feet (approximately 5.51 acres per pad, see **Figure 5**), with 25 additional feet around the entire perimeter for topsoil and other soil storage, resulting in approximately 450 feet by 650 feet (approximately 6.715 acres per pad) disturbance for each pad (**Table 2**). Actual dimensions of the well pads would be modified to best match the specific physical and environmental characteristics of the site and to minimize grading (cut and fill). Wells would be drilled in phases. Well sites deemed by the operator to be commercially non-viable will be reclaimed. Multiple wells will be drilled from each production pad to minimize surface disturbance. In some cases, drilling an excess number of wells from a single pad may require increasing the dimensions of the well pad,

however because this method would require fewer total well pads to complete the project, it would likely result in a reduction of the total surface disturbance. The total surface disturbance associated with well pad construction within the AOI would be approximately 156.73 acres (7.17 acres average per built pad plus 6.72 acres per planned pad, see **Table 2**). 12 well pads are built or planned to be located on BLM property, with the remaining 11 pads built or planned to be located on private property. Of the surface disturbance associated with well pads, approximately 83.04 acres (~53.0% of total well pad disturbance) is planned to be located on BLM property, with the remaining 73.69 acres (~47.0% of total well pad disturbance) planned to be located on private property.

Site preparation for well pads would take place as-described in Section 2.4.

Reserve pits would be constructed in accordance with BMPs identified in the Gold Book on each pad for the containment and temporary storage of water, drill cuttings, and circulating drilling mud during drilling operations. Geothermal fluid produced from the well during flow testing would also drain to the reserve pit.

The reserve pits would be fenced with an eight-foot exclosure fence on three sides and then fenced on the fourth side once drilling has been completed to prevent access by persons, wildlife, or livestock. Exclosure fencing would consist of chain-link fence or other BLM-approved fencing recommendations. The fence would remain in place until pit reclamation begins. To prevent livestock, wildlife, and persons from becoming entrapped, one side of the reserve pit walls would be sloped at an approximate 30 percent incline. The reserve pit would measure approximately 150 feet by 300 feet by 20 feet deep. Actual dimensions of the reserve pit would be modified to best match the specific physical and environmental characteristics of the site and to minimize grading.

Once drilling is complete, the shoulders of the pad could be reclaimed, but the majority of the pad must be kept clear for ongoing operations and the potential need to work on or re-drill the wells contained therein. Disturbed areas that are no longer being used will be reclaimed.

2.5.4. Well Drilling

A drilling supervisor would be on site at all times and would typically sleep in a trailer on the active drill site while the well is being drilled. The drilling crew may also live “on-site” during the drilling operations in a self-contained, mobile “bunkhouse” (comparable in size to a double-wide trailer, containing sleeping quarters, galley, water tank, and septic tank) or portable trailers. These quarters for the drilling crew may be placed on the active well pad, or on an inactive well pad nearby. Alternatively, the drilling crew may acquire accommodations in Milford, Utah, depending on lodging availability. Drilling crews for a 24-hour operation typically include two drillers, two company representatives, two mud loggers, one tool pusher, two derrickmen, two motormen, up to four floor hands, two roustabouts, two directional drillers, two mud engineers, and a mechanic on duty.

“Blow-out” prevention equipment would be utilized while drilling below the surface casing. Rig up and testing of the blow-out prevention equipment will be performed as per BLM regulatory requirements. EDR representatives and drilling crew will be trained in well control.

The well bore would be drilled using non-toxic, temperature-stable, water-based drilling fluid that may include bentonite clay or polymers for increased viscosity and carrying capacity. If required to improve the success of drilling operations, EDR may utilize underbalanced drilling with air, mist, foam, or aerated mud.

Variable concentrations of additives would be added to the drilling fluids as needed to improve drilling performance, 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 hazardous or toxic. Additional drilling mud would be mixed and added to the mud system as needed to maintain the required quantities. The specific drilling methodology, including drilling fluids, would be reviewed and approved by Utah Division of Water Rights (UDWRi) as part of the geothermal drilling permit application process.

Target depths at the Project geothermal field will initially range between 5,000 and 18,000 feet below ground surface (True Vertical Depth, TVD) but may change pending new well data, well testing results, improved drilling technologies, and increased understanding of the subsurface. Directional drilling will be employed to drill horizontal geothermal wells. Well casing would meet all requirements outlined in Geothermal Resources Operational Order No. 2, where the surface casing string would be set at no less than 200 feet TVD to prevent commingling of the geothermal fluids with underground aquifers.

The horizontal injection and production wells will be designed to target a TVD that meets the resource temperature requirements for commercial production, which is initially anticipated to range between 5,000 and 18,000 feet depending on location and target temperature, but may change pending new well data, well testing results, improved drilling technologies, and increased understanding of the subsurface. The wells will be drilled vertically to a predetermined kick-off point, at which point directional drilling techniques may be employed to build the curve section of the well from an inclination of zero degrees (vertical) to an inclination of approximately 90 degrees (horizontal) at a build rate of approximately 5 - 20 degrees per 100 feet of drilled length. The wells will then continue to be drilled horizontally, maintaining an approximately constant inclination and azimuth. The target azimuth for the curve section and lateral section will in part be determined based on the state of stress in the local geologic conditions of the formation and the temperature gradients of the formation - in some cases, drilling angled laterals to follow dipping temperature gradients may be employed. The curve section may be drilled at a combination of target inclinations, azimuths, and build rates to achieve the target landing point. Where appropriate, directionally-drilled and non-producing curve sections of each well may back-drill into un-leased areas to maximize production lateral length within the leased area - such back-drilling will follow governing UDWRi regulation. The length of the lateral section will depend on formation characteristics, currently targeting approximately 5,000 feet in length, although longer lateral lengths such as 7,500 feet to 10,000 feet may be considered. Multiple horizontal wells will be drilled from each well pad, significantly reducing the surface disturbance required to meet the target system capacity. Two or more benches of horizontal wells may be drilled from each well pad, spaced approximately 500 to 1,000 feet vertically, depending on target temperatures and permeability.

The vertical observation wells will be drilled to a similar depth as the target TVD of nearby horizontal wells. In some cases, the vertical observation wells may be drilled deeper than the target TVD of nearby horizontal wells, to further characterize the resource. The vertical observation well locations will target zones of the geothermal resource where the most useful information to inform Project development is expected to be acquired, based on available geologic data and reservoir modeling. Observation wells may also be drilled in non-vertical geometries, such as S-curve or slant well geometries. These injection, production, and observation wells will be constructed in-concert with the geothermal power plants in a phased approach.

Each well may need to be worked over or redrilled. Depending on the circumstances encountered, working over a well may consist of lifting the fluid in the well column with air or gas or stimulation of the formation using fresh water and proppant. Well redrilling may consist of: reentering and redrilling the existing well bore; reentering the existing well bore and drilling and casing a new well bore; or sliding the rig over a few feet on the same well pad and drilling a new well bore through a new conductor casing.

While the drill rig is still over the well, the residual drilling mud and cuttings would be flowed from the well bore and discharged to the reserve pit. Furthermore, a single well may be drilled by more than one drilling rig, where for example the surface casing is set by a dedicated smaller rig prior to the main drilling rig arriving on location.

2.5.5. Seismic Monitoring and Surveys

Three borehole seismic monitoring stations and arrays of temporary surface seismic monitors have been installed on federal property under the previously-approved Exploration EA. Additional borehole or surface seismic monitors may be installed. Target locations for additional monitors would be identified as the geothermal resource continues to be explored, and may be placed on federal, state, or private property within the AOI; seismic monitors placed on federal property in the AOI will be pre-surveyed to avoid additional impacts to biological or cultural resources, and will be subject to BLM sundry notice and approval. Seismic monitors would be used to gather high-resolution micro-seismic data during well completion, testing, and/or operational activities. Cumulative site disturbance for all seismic monitors combined is anticipated to be less than 1 acre.

Borehole seismic monitoring stations would consist of an approximately 50-300 foot drill hole installed by a standard size truck, with no drill pad constructed and minimal site surface disturbance. The station would be powered by a small solar panel and would host either a broadband geophone or accelerometers. An area approximately 10 feet by 10 feet around the station would be fenced for livestock. Where possible, sites would be placed within walking distance of existing or planned roads.

Temporary surface seismic monitors would generally consist of arrays of small geophones and sensors, containing battery-powered or solar-powered electronic instruments such as a needle sensor, micro-seismic recorder, and/or transmitter. To install, geophone assemblies would typically be placed in a shallow hole, and covered with a thin layer of dirt. Geophones would be transported by foot or by vehicle to each installation site, driven either on existing roadways

or overland without surface disturbance where required.

Other seismic monitors or related surveys may be implemented, such as Magnetotelluric (MT) surveys, Surface Orbital Vibrators (SOVs), gravity surveys, or seismic surveys to further analyze the geothermal resource and inform Project development. Any such seismic monitoring locations or surveys on federal property in the AOI that are anticipated to cause surface disturbance will be pre-surveyed to avoid additional impacts to biological or cultural resources, and will be subject to BLM sundry notice and approval.

2.5.6. Well Completion

The horizontal injection and production wells will be completed with multiple casing sections. Most wells will be completely cased and cemented to the measured depth (MD) of the well, though some wells may have lateral sections left uncased in an 'open hole' configuration, depending on the geologic characteristics and permeability. Hydraulic communication between the wellbore and the formation will then be established through a series of sequential perforation operations. In addition, reservoir stimulation techniques may be employed. The reservoir stimulation treatment involves performing several stimulation "stages" along the lateral section of the wellbore. In each stage, a temporary plug is set at a predetermined location along the well and a series of perforation holes are placed along a predetermined length of the wellbore that defines the stage, typically around 100 to 300 feet long. A slurry of water, proppant, and fluid additives is then pumped to stimulate the formation. That process is repeated several times along the length of the wellbore. Once all stages are completed, the temporary plugs either dissolve or are drilled out, at which point the well is prepared for well testing or production. Although the stimulation treatment method described here is the most common stimulation technique, other similar techniques may be used, such as the use of sliding sleeves.

2.5.7. Well Testing

Short-term well tests may be performed on wells. The short-term well tests would last up to seven days on average. Short-term well tests on wells would involve injecting fluid into injection wells (typically using pump trucks, temporary injection pumps, or permanent injection pumps to inject fresh water, groundwater, or geothermal brine) and production fluid from production wells (typically by flowing the fluid into a portable muffler, the unlined or lined reserve pit(s), portable steel tanks, or a combination) while monitoring temperature, pressure, flow rate, chemistry, and other parameters. If required, a workover rig or a coil tubing unit may be used to airlift production fluid and initiate production. In some cases, short-term injection tests may also be performed on production wells in order to measure reservoir properties. A typical short-term well test would involve injecting and/or producing fluid at rates sufficient for commercial electricity generation, dependent on the hydraulic conductivity of the formation.

One or more long-term flow test(s) would likely be conducted in addition to the short-term flow test, to more accurately determine long-term well and geothermal reservoir productivity. In some cases, short-term well testing may immediately proceed, and be indistinct from, long-term well testing. Long-term flow test(s) would be conducted by injecting geothermal fluids or

water down injection well(s), while produced geothermal fluids from production well(s) are directed into on-site storage or filtered and reinjected down the injection well(s). The on-site test equipment would include surface storage tanks, standard flowback spread, standard flow metering, recording, and sampling apparatus. In some cases, long-term well tests on production wells and injection wells will be performed concurrently.

2.5.8. Drilling and Completion Water Sourcing, Usage, and Storage

The water requirements typically vary considerably between the drilling, completion, and well testing phases for a given well. During the drilling phase, the total water requirement is anticipated to be approximately 50,000 barrels per well. The drilling phase is anticipated to last approximately 30 days per well, which equates to an average water requirement of approximately 1,666 barrels per day. During the completion phase, the total water requirement is anticipated to be approximately 300,000 to 400,000 barrels per well. However, the completions phase occurs over a significantly shorter duration compared to the drilling phase, typically taking about 7 days per well. Therefore, the average water requirement during the completions phase is expected to average approximately 60,000 to 90,000 barrels per day over each 7-day period. Drilling and completions water volume requirements assume a horizontal lateral length of 5,000 feet - horizontal laterals of greater lengths may require additional water. Water requirements for grading, construction, and dust control would average substantially less at around 143 barrels per day.

Drilling and completion water may be pumped from source locations to dedicated water storage impoundments (existing impoundments shown on **Figure 4**) and from there pumped to well pads via a network of temporary water pipelines, either placed at ground surface with no disturbance, or buried in a shallow trench. Buried temporary water pipelines would be sited along corridors pre-surveyed to avoid additional impacts to biological or cultural resources, and would be placed parallel to access roads or other planned disturbance corridors to avoid increased surface disturbance. Where distances from water storage impoundments to well pads are prohibitively long, additional water storage impoundments may be constructed, which would also be pre-surveyed to avoid additional impacts to biological or cultural resources. Inactive well pad reserve pits may also be used for water storage and/or pump staging. Additionally, one or more portable water tank(s) may be maintained on the well sites during drilling operations.

Water necessary for these activities would be obtained from shallow water well(s) drilled from one or more proposed drill sites, after acquiring water rights and filing a change application for use of those rights with UDWRi, where each well location would be determined upon individual need. Each water well would be temporary, drilled by a licensed water well driller, and cemented with casing to provide a sanitary seal at the surface. The well would be drilled down to a productive interval of sands, gravels, or fractures (estimated at between 100 and 3,000 feet below the surface). An electric submersible pump would then be run to below the producing interval. Once no longer necessary, the well would be plugged and abandoned in accordance with Utah Administrative Code R655-4-14, with cement plugs across the bottom of the casing and, if needed, with additional plugs to isolate individual producing zones as-necessary. Actual water well sizing and depths drilled may be modified as field conditions require, as allowed by UDWRi permits and regulations.

Alternatively, water could be obtained from a private or municipal well and trucked to each drill site. If water is trucked to the Project area, the frequency of trips would depend on the rate of fluid loss down the well while drilling and the capacity of the available water trucks. EDR would determine the water source while a Geothermal Drilling Permit (GDP) and drilling program is being reviewed for the specified well site location to be drilled.

2.5.9. Wellhead Installation and Operations Preparation

After well drilling and completions are concluded and the wells are determined to be commercially viable, the wells and well pad will be converted to operational use. Wellhead spools and valves will be installed, connecting wells to pipeline manifolds, allowing geothermal fluid to be cycled from power plants to injection wells and recovered through production wells, as-described in Section 3.2. Electric pumps may be installed on-pad and supplied with power via buried, cable-tray, or overhead electric sub-transmission lines, as-described in Section 3.1. Unused areas of the well pad will be reclaimed with topsoil and BLM-approved seeding, where appropriate.

Prior to power generation, exploration wells developed under the previously-approved Exploration EA that EDR deems to have commercial potential as injection wells will be converted to Class V Injection Wells under a UDWRi Underground Injection Control (UIC) permit.

2.6. Power Plant Construction

2.6.1. Power Plant Locations

Up to 20 power plants are planned to be constructed in multiple phases of development. The power plants will all be located on private land near the proposed well pad locations, as-detailed in **Figures 4** and **6**, as well as **Table 3**. The target locations identified may be relocated to other state or private property within the AOI as new leasing arrangements are finalized and as the geothermal resource continues to be explored; relocations onto federal property on the AOI will be pre-surveyed to avoid additional impacts to biological or cultural resources, and will be subject to BLM sundry notice and approval.

2.6.2. Power Plant Pads and Laydown Yards: Construction Material Requirements & Sources

Construction of power plant pads, foundations, and associated laydown yards / staging areas will require aggregates and concrete. Aggregate material for power plant construction would be obtained from a local source, such as the Martin Marietta Milford Quarry (see **Table 5** in Section 2.2). Concrete would also be obtained from a local source, such as a batch plant in Milford or other plants near the Project.

Power plant pads would be composed of compacted earth underlying foundational concrete footings. Laydown yards / staging areas may be covered with approximately four inches of gravel where necessary to create an all-weather surface and to prevent the formation of ruts. Total aggregate (if required) for all laydown yard / staging area construction is estimated at 40,016 cubic yards (approximately 26.56 acres in the initial phase + approximately 47.85 acres in subsequent phases x 4-inch depth).

2.6.3. Power Plant Pads and Laydown Yards: Construction Procedures & Surface Disturbance

Site preparation for power plant pads and laydown yards / staging areas would take place as-described in Section 2.4.

Power plants would be constructed incrementally in multiple phases, beginning with three plants in the initial phase, followed by up to 17 additional plants constructed in-sequence as wells are brought on-line. Power plant pads for units 1, 2, and 3 would average approximately 650 feet square (approximately 9.70 acres disturbance per pad). Actual dimensions of the power plant pads would be modified to best match the specific physical and environmental characteristics of the site and to minimize grading (cut and fill). Laydown yards / staging areas will be constructed adjacent to each power plant pad to facilitate construction. These yards will be custom shaped according to each power plant location, and are anticipated to average approximately 3.22 acres per power plant. The total surface disturbance associated with power plant pad and laydown yard / staging area construction within the AOI would be approximately 290.08 acres (23.46 acres average per designed plant plus 12.92 acres average per planned plant). All surface disturbance associated with power plant pads and laydown yards / staging areas is planned to be placed on private property. Power plants constructed in the initial phase will be used to inform the design and specifications of the power plants constructed in subsequent phases, which are anticipated to require a smaller footprint by limiting / combining laydown yards and more efficiently using footprints of disturbance.

Stormwater containment would be constructed downstream of power plant pads and laydown yards / staging areas where necessary for the containment and temporary storage of stormwater runoff. Containment structures or impoundments would be built in accordance with BMPs identified in the "Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (The Gold Book)" (Fourth Edition – Revised 2007).

The perimeter of each power plant pad would be fenced and have gates for vehicle and personnel access control. Exclusionary fencing is planned to be of chain link construction topped with barbed wire, and would be constructed to conform with all jurisdictional federal, Occupational Safety and Health Administration (OSHA), or other regulatory guidelines. The total height of fencing will be 8 ft tall, with 1 ft or more of barbed wire at the top included in the total height. Barbed wire will be included to discourage unauthorized and unsafe access. Fencing will remain in-place throughout power plant operations.

Once power plant assembly is complete and operational, laydown yards / staging areas that are no longer required for operations will be reclaimed. Laydown yards / staging areas considered necessary for ongoing operations will remain, or may be repurposed as parking lots or other associated operational uses. Power plant pads and laydown yards / staging areas remaining for operations will be stabilized as necessary per American Society of Civil Engineers (ASCE) requirements.

2.6.4. Power Plant General Design, Components, and Assembly

Three Binary ORC power plants, each capable of producing 36 MW net electric power from geothermal heat energy will be constructed in the initial phase; a general description of these power plants is provided in Section 1.3.4. A schematic detailing one concept design of an ORC

power plant is shown in **Figure 8**, though dimensions and overall appearance may differ as variable geothermal fluid temperature and equipment availability requires. The concept design shown in **Figure 8** assumes a power plant footprint roughly 355 ft wide by 475 ft long by 46 ft in height. The primary visual feature in the power plant is the cooling system support structure and cooling fans. This cooling system structure would be oriented northeast as-shown in units 1, 2, and 3 in **Figure 6**, parallel to the direction of prevailing winds in the Project area, to maximize heat dissipation.

Binary ORC plants use a combination of electrical and mechanical equipment components, including heat exchangers, turbines, pumps, generators, breakers, transformers, switchgears, motors, variable frequency drives (VFDs), and cooling fans / cooling systems to produce electricity. Buildings, structures, plumbing, and mechanical equipment will meet or exceed the relevant standards specified in the 2021 International Building Code (IBC), as-published by the International Code Council (ICC). Electrical components will comply with one or more of the following:

- Carry U/L Certification or equivalent certification
- Meet or exceed the relevant standards specified in the 2020 National Electrical Code (NEC), as-published by the National Fire Protection Association (NFPA)
- Meet or exceed the relevant standards in international or jurisdictional intranational electrical codes where such electrical equipment was manufactured, provided such standards also meet or exceed the relevant standards specified in the 2020 NEC

Power plant design will be subject to permit review and approval by the Beaver County Building Department. Prior to assembly, power plant equipment, such as the turbines, generators, heat exchangers, air cooled condenser bundles will be driven to the Project site and staged in laydown yards. Construction crews will assemble the components on power plant foundations using cranes, workover rigs, and/or other assembly vehicles. OSHA safety standards will be followed during all construction and assembly periods.

A construction supervisor will be on site at all times during active power plant construction and assembly. Construction crews and supervisors may live “on-site” during construction and assembly in self-contained, mobile “bunkhouses” (comparable in size to double-wide trailers, containing sleeping quarters, galley, water tank, and septic tank) or in portable trailers. These living quarters may be placed in the laydown yard areas, or on an inactive well pad nearby. Alternatively, the construction crew may acquire accommodations in Milford, Utah, depending on lodging availability. Construction crew personnel required for the initial phase of power plant assembly will fluctuate throughout the construction schedule, and is anticipated to peak at roughly 175 to 225 at any one time.

Up to 17 additional power plants may be constructed in subsequent phases and will also be Binary ORC or functionally-similar power plants. All components, equipment, and assembly procedures for power plants constructed in subsequent phases will adhere to the safety code requirements specified for the power plants constructed in the initial phase. Power plant construction in subsequent phases may require 150 or more personnel, depending on the final construction schedule.

Once assembled for operation, no power plant equipment or ancillary structures are expected to exceed the 200 ft above-ground requirement for aviation lighting, therefore no aviation lighting will be required.

2.6.5. Power Plant Decommissioning

Power plant facilities are intended to operate for a 20-year or greater life span. The life of the plant can be extended with the proper maintenance and equipment overhaul activities. Once the operational life is met, individual power plants would be decommissioned and re-purposed, and the disturbed footprints reclaimed according to the specifications found in Section 5.

3.0. RELATED FACILITIES AND SYSTEMS

3.1. Interconnection: Sub-Transmission, Switchyard, and Transmission System

Multiple facilities will be constructed to interconnect the power plants to the electrical grid, including a power distribution network of 69 kV or similar sub-transmission lines carrying generated voltage from individual power plants to well pads and to a centralized collector switchyard, which will convert the generated voltage of the power plants to a 362 kV transmissible voltage level for long-distance travel, and a 362 kV transmission line to transmit the higher voltage from the switchyard to the existing Milford substation.

3.1.1. Existing Tie-In & Interconnect Agreement

An interconnection request has been submitted to Longroad Energy, the owner of an existing 88-mile 362 kV generation tie-line that connects to the Milford substation, located at 38.56220°N, 112.93828°W. A facilities study has been commissioned to determine what upgrades to the Milford substation may be required to facilitate EDR's Project interconnection, completed in April 2024. Required upgrades to accommodate the interconnection at the Milford substation will adhere to Longroad Energy's applicable standards. Where no applicable standards are available, industry standards and other good utility practices will be applied. A Large Generator Interconnection Agreement (LGIA) and Transmission Service Agreement (TSA) was executed with Longroad Energy in June 2024.

3.1.2. Sub-Transmission Line Routing and Switchyard Location

A network of 69 kV or similar sub-transmission lines will be constructed between power plants, well pads, and the central switchyard along corridors as-shown in **Figure 4** - sections of sub-transmission lines will be constructed in multiple phases of development. The identified target sub-transmission corridors may be relocated within the AOI as new leasing arrangements are finalized and as the geothermal resource continues to be explored. Relocations within federal property on the AOI will be pre-surveyed to avoid additional impacts to biological or cultural resources, and will be subject to BLM sundry notice and approval. Sub-transmission line corridors will consist of a line of galvanized steel monopole or similar structures, supporting one or more overhead 69kV electric lines, with a two-track or similar maintenance road adjacent. Tangents and deadends will both be direct embed monopoles with crushed rock backfill. Deadends will require the use of guys and anchors to support the structure. Alternatively, some sections of sub-transmission lines may also be buried or placed in cable trays. Buried sub-transmission lines would be placed in a narrow trench in armored cable or conduit, and labeled with visible markings at ground surface. Buried or cable-tray sub-transmission lines would be sited along corridors pre-surveyed to avoid additional impacts to biological or cultural resources, and would be placed parallel to access roads or other planned disturbance corridors to avoid increased surface disturbance.

Transmission and overhead sub-transmission lines will be constructed per APLIC recommendations and/or Avian Protection Plan Guidelines to minimize electrocutions and collisions. Guyed structures will be equipped with avian/bat diverters at sufficient intervals to minimize the potential for impacts associated with bird/bat strikes. Perch deterrents may be utilized to reduce avian predation and would be approved by the BLM Authorized Officer.

A roughly 10-acre switchyard would be constructed on private property at approximately 38.50447°N, 112.92121°W, as-shown in **Figures 4** and **6**. This switchyard is centrally-located to be the gathering point for all Project sub-transmission lines. The switchyard pad would measure approximately 850 feet by 515 feet. The central switchyard will be constructed in the preliminary phase of development, along with sections of the sub-transmission lines connecting the switchyard to power plant units 1, 2, and 3 and connecting to the Bearskin, Gold, and Frisco well pads for ongoing operational power. Concept layouts of this initial phase of construction are shown in **Figure 6**. Additional sections of sub-transmission lines will be constructed in future phases of development.

3.1.3. Transmission Line Routing

A single 362 kV transmission line approximately 6 miles in length will be constructed in the initial phase of development to connect the central switchyard to the existing Milford Substation along the corridor as-shown in **Figures 4** and **8**. The identified target transmission corridor may be relocated or the offtake point transitioned to an as yet unknown behind-the-meter application; relocations within federal property on the AOI will be pre-surveyed to avoid additional impacts to biological or cultural resources, and will be subject to BLM sundry notice and approval. An approximately 200-ft wide ROW (100-ft on either side of the transmission centerline) will be established along the length of the transmission line. The actual disturbed corridor is anticipated to be substantially less wide, as-described in Section 3.1.4. A ROW agreement will be required for the approximately 2,400-ft portion of the power transmission corridor crossing BLM property outside the BLM lease area to the Milford Substation, for which a SF-299 form will be submitted. The 362 kV transmission line structures will be galvanized steel or similar structures. Tangents will be direct-embedded H-Frame or similar structures using crushed rock backfill (see **Figure 9**). Deadends will be 3-pole or similar structures and will be supported by a concrete drilled shaft foundation.

3.1.4. Sub-Transmission, Switchyard, and Transmission System: Construction Procedures & Surface Disturbance

The total surface disturbance associated with the power sub-transmission, switchyard, and transmission system within the AOI would be approximately 84.39 acres (30.39 acres of sub-transmission line disturbance, 43.97 acres of transmission line disturbance, and 10 acres of switchyard disturbance). Surface disturbance associated with sub-transmission line construction assumes approximately 50,470 linear feet of sub-transmission line required x a 40-ft-wide construction corridor for earthmoving and construction equipment, narrowing to 20-ft-wide where the construction corridor is shared with geothermal fluid pipeline corridors (approximately 34,747 linear feet of sub-transmission line corridor is planned to be shared sub-transmission and pipeline corridor). Surface disturbance associated with transmission line construction assumes approximately 31,886 linear feet of transmission line required x a 60-ft-wide construction corridor for earthmoving and construction equipment.

Of the total disturbance associated with the power sub-transmission, switchyard, and transmission system, approximately 28.42 acres (~33.7% of the total system surface disturbance) are planned to be located on BLM property. The remaining 55.97 acres (~66.3% of the total system surface disturbance) are planned to be located on private property.

Approximately 22,720 linear feet of sub-transmission line (45.0% of the total sub-transmission line length) and 5,100 linear feet of transmission line (16.0% of the total transmission line length) are planned to be placed on BLM property, with the remaining lengths placed on private property. Of the 5,100 linear feet placed on BLM property, approximately 2,400-ft linear feet will cross BLM property outside the BLM lease area to the Milford Substation.

Several hundred pole foundations are anticipated to be required to construct the transmission line and sub-transmission lines; however, the long-term operational impact is only a few square feet for each foundation; the resulting total long-term operational impact from pole foundations is anticipated to be less than 1 acre for either the transmission line or sub-transmission line system. In addition, sub-transmission and transmission construction corridors are anticipated to be largely reclaimed following construction, with single-lane, 10-ft-wide maintenance roads left adjacent for long-term operational requirements where necessary for access.

Site preparation for the switchyard pad would take place as-described in Section 2.4.

Once constructed, the perimeter of the switchyard pad would be fenced and have gates for vehicle and personnel access control. Exclusionary fencing is planned to be of chain link construction topped with barbed wire, and would be constructed to conform with all jurisdictional federal, OSHA, or other regulatory guidelines. The total height of fencing will be 8 ft tall, with 1 ft or more of barbed wire at the top included in the total height. Barbed wire will be included to discourage unauthorized and unsafe access. Fencing will remain in-place throughout switchyard operations.

3.1.5. Sub-Transmission, Switchyard, and Transmission System: Construction Material & Sources

Construction of the sub-transmission lines, switchyard, and transmission line will require aggregates and concrete. Aggregate material for power plant construction would be obtained from a local source, such as the Martin Marietta Milford Quarry (see **Table 5** in Section 2.2). Concrete would also be obtained from a local source, such as a batch plant in Milford or other plants near the Project.

The switchyard pad would be composed of compacted earth underlying approximately four inches of gravel to create an all-weather surface and to prevent the formation of ruts. Total aggregate required for the switchyard pad construction is estimated at 538 cubic yards (10 acres x 4-inch depth). Concrete footings will be poured where necessary for switchyard equipment foundations.

Sub-transmission tangent poles, sub-transmission deadends, and transmission tangent poles will be embedded using crushed rock backfill. Transmission deadends will be supported by concrete drilled shaft foundations. Guy wires may use concrete anchors where necessary.

Dedicated maintenance roads adjacent to sub-transmission lines and the transmission line for long-term operational use are anticipated to be 10-ft-wide, and either two-track dirt roads or built up with aggregates as-required by the topography. Some sections of sub-transmission lines may run adjacent to existing or planned two-lane access roads, which may function as the

maintenance road to minimize surface disturbance.

3.1.6. Sub-Transmission, Switchyard, and Transmission System: General Design & Components

Transmission and overhead sub-transmission lines will be constructed per APLIC recommendations and/or Avian Protection Plan Guidelines to minimize electrocutions and collisions. Guyed structures will be equipped with avian/bat diverters at sufficient intervals to minimize the potential for impacts associated with bird/bat strikes.

Schematics detailing one concept design of the switchyard are shown in **Figures 10** and **11**, though dimensions and overall appearance may differ as-required to accommodate changes in voltage and equipment availability.

Construction of the switchyard will follow applicable industry codes and standards, including Institute of Electrical and Electronics Engineers (IEEE), American National Standards Institute (ANSI), American Concrete Institute (ACI), American Institute of Steel Construction (AISC), NFPA, and ASCE standards, as detailed in **Table 6** below.

Electrical components installed in the switchyard would include 69 kV circuit breakers to protect the transmission lines between the switchyard and power plants, five 350 megavolt ampere (MVA) 69 kV/362 kV transformers, 69 kV potential transformers for system protection, 362 kV current and potential transformers for metering and system protection, and 362 kV circuit breakers to protect the switchyard and the transmission line between the switchyard and the Milford substation. A main control enclosure would contain relaying and telecommunications equipment.

The switchyard will utilize light-emitting diode (LED) lighting, controlled by lighting contactors in the control enclosure. LED lighting will provide 2 foot-candles near equipment and 0.2 foot-candles in remote areas, per National Electrical Safety Code (NESC) guidelines. Uplights will be installed at all disconnect switch locations to provide illumination for personnel to visually see the breaks when the switches are open at night. Noise levels will adhere to applicable county requirements for such facilities.

Once fully-constructed, no sub-transmission, switchyard, or transmission structures are expected to exceed the 200 ft above-ground requirement for aviation lighting, therefore no aviation lighting will be required.

Table 6: Sub-Transmission, Switchyard, and Transmission System: Codes & Standards

Standards	Applicable Version
IEEE 998 – Guide for Direct Lightning Stroke Shielding of Substations	2012
IEEE 80 – Guide for Safety in AC Substation Grounding	2013
IEEE 979 – Guide for Substation Fire Protection	2012
IEEE 605 – IEEE Guide for Design of Substation Rigid Bus Structures	2008
IEEE 1584 – IEEE Guide for Performing Arc Flash Hazard Calculations	2022
NESC C2 – National Electrical Safety Code	2023
ANSI/NEMA CC-1 – Electric Power Connectors for Substations	2018
NFPA 70 – National Electric Code	2020
IEEE 1427 – IEEE Guide for Recommended Electrical Clearances and Insulation Levels in Air Insulated Electrical Power Substation	2020
IEEE C37.30.1 – IEEE Standard Requirements for AC High-Voltage Air Switches Rated Above 1000V	2022
ACI 318 – Building Code Requirements for Structural Concrete	2019
AISC – Steel Construction Manual	15th Edition
ASCE 7 – Minimum Design Loads for Buildings and Other Structures	2016
ASCE 32 – Design & Construction of Frost Protected Shallow Foundations	2001
ASCE 113 – Substation Structure Design Guide	2008
IEEE 693 – IEEE Recommended Practice for Seismic Design of Substations	2018

3.2. Geothermal Fluid System and Pipelines

A network of pipelines will be constructed to supply ground water and cycle geothermal fluid to and from geothermal well pads, water source wells, and power plants. Functional cycling of geothermal fluid through the network is described in detail in Section 1.3.7.

3.2.1. Geothermal Fluid Pipeline Routing

The geothermal fluid pipeline network will be composed of hot geothermal supply lines from production wellheads to power plants, and cooled geothermal fluid return lines from power plants to injection wellheads. In addition, cold water supply lines will be constructed from water source wells to supply makeup water. Pipelines will be constructed along corridors as-shown in **Figure 4** - sections of pipelines will be constructed in multiple phases of development. The identified target pipeline corridors may be relocated within the AOI as new leasing arrangements are finalized and as the geothermal resource continues to be explored. Relocations within federal property on the AOI will be pre-surveyed to avoid additional impacts to biological or cultural resources, and will be subject to BLM sundry notice and approval. Pipeline corridors will consist of carbon steel pipelines placed above-ground on conventional pipe stands, or below-ground in prepared trenches, with a two-track or similar maintenance road adjacent.

3.2.2. Geothermal Fluid Pipelines: Construction Material Requirements & Sources

Construction of the pipeline network will require aggregates and concrete. Aggregate material for power plant construction would be obtained from a local source, such as the Martin Marietta Milford Quarry (see **Table 5** in Section 2.2). Concrete would also be obtained from a local source, such as a batch plant in Milford or other plants near the Project. Concrete footings will be poured along each pipeline where necessary for pipe stand foundations.

Dedicated maintenance roads adjacent to pipelines for long-term operational use are anticipated to be approximately 10-ft-wide, and either two-track dirt roads or built up with aggregates as-required by the topography. Some sections of pipeline may run adjacent to existing or planned two-lane access roads, which may function as the maintenance road to minimize surface disturbance.

Other pipeline construction materials include carbon steel pipe, fittings, valves, filters and structural steel. As much as possible, all materials will be sourced from Utah-based and/or US-based vendors and specified in accordance with applicable ASME, IEEE, NEC, and/or ASCE requirements.

3.2.3. Geothermal Fluid Pipelines: Construction Procedures & Surface Disturbance

The total surface disturbance associated with the geothermal fluid system within the AOI would be approximately 31.91 acres. Surface disturbance associated with pipeline construction assumes approximately 34,747 linear feet of pipeline required x a 40-ft-wide construction corridor for earthmoving and construction equipment. Pipeline corridors are planned to be shared with sub-transmission line corridors to overlap and minimize surface disturbance requirements.

Of the total disturbance associated with the geothermal fluid system, approximately 12.41 acres (~38.9% of the total pipeline surface disturbance) are planned to be located on BLM property. The remaining 19.50 acres (~61.1% of the total pipeline surface disturbance) are planned to be located on private property. Approximately 13,516 linear feet of pipeline are planned to be placed on BLM property, with the remaining lengths placed on private property.

Several hundred pipe support piles and pipe stands will be required along the length of the proposed pipelines where above-ground pipelines are constructed; the resulting long-term operational impacts from pipe supports is calculated to be a 5-ft-wide corridor of disturbance along the length of the pipeline, though in practice it may be substantially less due to only concrete pile locations causing long-term operational disturbance. Sections of pipeline that are placed below ground will be fully reclaimed at ground surface, except where surface access ports for maintenance are constructed. The remainder of pipeline construction corridors are anticipated to be largely reclaimed following construction, with single-lane, 10-ft-wide maintenance roads left adjacent for long-term operational requirements where necessary for access.

3.2.4. Geothermal Fluid System General Design and Components

Carbon steel pipelines will be used for geothermal fluid cycling, in sizes generally ranging from

4" to 24" in diameter. Pipe, valves, fittings, and other miscellaneous supplies will be delivered to the Project area and stored in one of the nearby power plant laydown yards / staging areas until ready for installation. Pipe fabrication will largely take place in a dedicated fabrication area in one of the laydown yards. Concrete piles will be poured at pipe stand locations and structural steel connected to the piles in order to carry the pipe. Crane, vehicular, and foot traffic can be expected on and near the pipeline route during construction.

Piping lengths will be minimized wherever possible, and will be sized to carry the required flows with minimal pressure drop. Above-ground piping will be fabricated to American Society of Mechanical Engineers (ASME) 31.1 and 31.3 standards, while underground piping will be fabricated to ASME B31.4 standards. Any concrete work, such as piles for pipe supports, will be constructed to applicable ASCE standards. Process Industry Practices (PIP) will be distributed to contractors performing construction activities. Any electrical specifications inherent to the pipeline system will follow applicable IEEE and/or NEC standards, and NEC standards will be embedded in the construction standards for electrical and instrument scopes.

Heat loss from piping due to convection and radiation would be minimized where appropriate with pipe insulation. Expansion joints will be placed at regular intervals to accommodate pipe growth due to thermal expansion and contraction. The piping system will be equipped with pressure, temperature, flow, and fiber optic measurement devices to facilitate optimum compliance, operation, and troubleshooting if required. Pipe shoes will be used at all connections to mechanical bents. The piping system will undergo a stress analysis to determine anchor points and spring settings to accommodate expansion and surge.

EDR is pursuing potential options for burying geothermal fluid pipelines. Burying geothermal fluid pipelines have several potential benefits, including limiting visual impact and minimizing permanent surface disturbance. EDR will pursue all relevant state permitting required prior to installation of such a system.

Overall system requirements, including geothermal fluid temperature and cycled fluid volume, are dictated by the specific power plant design and associated PPA. Cycled volumes and injection rates will be determined via geothermal resource modeling and flow testing, refined to achieve the required temperatures to achieve the targeted power delivery.

3.2.5. Geothermal Fluid Volumes and Makeup Water

Depending on geothermal resource temperature and power plant requirements, approximately 8-to-40 kg/s of geothermal fluid will be required to generate each MW of electrical power once each well reaches a state of steady flow. Modeling and detailed power plant engineering will be used to determine the exact flow-rate required by each power plant, based on data acquired during flow testing. Pipelines will be sized to accommodate the maximum required flow rate of each unit.

Geothermal fluids will be primarily composed of locally-sourced groundwater. Water sources low in calcium, iron, magnesium, and hydrogen sulfide (H2S) will be targeted for use in order to minimize internal pipe scaling and avoid hazards to personnel. Filtration will be used where necessary to minimize these chemicals and/or particulate matter. Groundwater local to the Project is within UDWRi's Water Management Area 71 (Escalante Valley). Water used for

drilling, completions, and testing associated with the previously-approved Exploration EA has been supplied with leased water rights and approved for use by the UDWRi under an Approved Temporary Change Application.

The geothermal fluid system would be designed to be closed-loop above ground, limiting or eliminating any evaporative or other surface losses. The only potential discharge would occur underground, in the water volume released through the pores and fractures in the geothermal reservoir, also known as the 'leak-off'. Effectively, this means that all water released during power generation would be returned to the reservoir of origin.

Minimal leak-off of geothermal fluid within the resource is expected, as evidenced by previous pilots and exploration well testing. Leak-off volumes will be replenished with makeup water sourced from groundwater wells, anticipated to equalize with the leak-off water released to the geothermal reservoir over time. This recycling, recharging system of groundwater use should allow ongoing makeup water replenishment to be classified as non-consumptive; therefore, EDR intends to apply for a non-consumptive appropriation with the UDWRi for the long-term use of supplying makeup water and production water. Alternatively or in-concert with the non-consumptive appropriation, EDR may continue to meet water supply needs with leased water rights.

3.3. Direct Air Capture Carbon Sequestration

Direct Air Capture (DAC) technologies capable of extracting carbon dioxide (CO2) directly from the atmosphere are currently under evaluation to determine if such technologies could be applied to the Project. DAC technologies under evaluation would use excess heat from the produced geothermal fluid to extract atmospheric CO2, either via liquid solvents or solid sorbents. Liquid solvent-based DAC systems pass air through liquid chemicals that remove CO2 and return the scrubbed air to the atmosphere. Liquid chemicals are then passed through a high-temperature process to remove the CO2, which is then compressed for transport and the liquid solvent recycled for use. Solid sorbent-based DAC systems use physical filters to bind the CO2 to solid chemicals and return the scrubbed air to the atmosphere. The filters are then passed through a heated system to release and capture the CO2, which is then compressed for transport and the solid sorbents are recycled for use.

All DAC technologies currently under evaluation include components such as air contractors with fan assemblies for cycling the air, desorption units, and compression systems for transportation of captured CO2. Air contractors resemble power plant cooling tower assemblies, with an induced draft fan to flow air across the liquid solvent or solid sorbent materials. Desorption units resemble chemical process separation columns, and compression units contain multiple compressors to liquify the final CO2 product for transportation off site.

If planned for installation on federal surface, EDR would file for BLM approval via sundry notice. No additional surface disturbance is anticipated for DAC systems, as they would be installed on pre-existing well pads or power plant pads. Estimated footprint requirements range between 1 and 3 acres for a DAC system capturing 10,000 tonnes of CO2 per year. Such a system would consume a small volume of water through evaporative loss, ranging between 16 and 32 acre-ft per year, supplied by EDR's permanent water supply system.

4.0. POWER GENERATION OPERATIONS AND MAINTENANCE

4.1. Operation and Facility Maintenance Requirements

As phases of interconnected well fields and power plants are brought on-line, ongoing power generation operations will begin.

All cycling fluids associated with the power plant, including the hydrocarbon working fluid and geothermal fluid will be kept in closed loop systems within the power plant and pipelines, with no substantive chemical or steam emissions required for operations. Noise and lighting will be minimized and will conform to professional standards and jurisdictional regulatory requirements. Small generators may be required for emergencies, critical safety loads, or standby operations, but would not be required for typical power generation operations. Generators would be powered by either diesel or natural gas, and would be stored onsite for rapid deployment as-needed. No substantive operational emissions are anticipated, however emergency relief safety devices would be installed in case of over-pressurization as per applicable safety code.

The detailed facility design would include a lighting and noise study on the final power plant configuration. Ambient overnight lighting would be minimized to only areas required for safe operations or regulatory requirements. Where necessary, ambient lighting would be designed to cause minimal light outside the operating area.

4.2. Maintenance Activities

Typical operations would include standard maintenance tasks for power plants, pipelines, and electrical equipment, including but not limited to:

- Lubrication
- Replacement of consumable parts
- Inspections
- Cleaning activities

Maintenance tasks would be performed by trained and qualified operational personnel, following applicable industry maintenance standards. In some instances, the Original Equipment Manufacturer (OEM) would be leveraged to perform maintenance and overhaul for critical equipment.

4.3. Operations Workforce and Equipment

Power generation operations would require a number of personnel, including plant management, mechanical technicians, electrical/instrumentation technicians, maintenance personnel, and control room operators. EDR would employ trucks and material lifting equipment to ensure safe and efficient operations.

5.0. ENVIRONMENTAL PROTECTION

5.1. Surface Stabilization and Reclamation

After well drilling and testing operations are completed, the liquids from the reserve pits would either naturally percolate, evaporate, or be removed as necessary to reclaim the reserve pits. The solid contents remaining in each of the reserve pits, typically consisting of non-hazardous, non-toxic drilling mud and rock cuttings, would be tested in accordance with the Gold Book (BLM 2007), existing state standards, or with project-specific requirements of the drilling and water permitting agencies to confirm that they are not hazardous or otherwise regulated. Typical tests may include the Toxicity Characteristic Leaching Procedure (United States Environmental Protection Agency [EPA] Method 1311), tests for heavy metals (EPA method 6010); pH (EPA method 9045D); Total Petroleum Hydrocarbons/Diesel (EPA Method 8015B); and Oil and Grease (EPA Method 413.1). Non-hazardous and non-toxic drilling mud and cuttings would be buried in the reserve pit, and any drilling mud and/or cuttings identified as hazardous or toxic, would be disposed of according to Utah Department of Environmental Quality (UDEQ) - Division of Waste Management and Radiation Control (DWMRC) regulations.

If a well is judged by EDR to have no commercial potential, it may continue to be monitored, but would eventually be plugged and abandoned in conformance with the well abandonment requirements of the BLM and UDWRi. Abandonment typically involves placement of two or more tested cement plugs in the wellbore to isolate formations and prevent interzonal fluid migration. The well head (and any other equipment) would then be removed, the casing cut off below ground surface according to BLM and/or UDWRi abandonment requirements, and the hole backfilled to the surface.

The portions of the cleared well pads, power plant pads, laydown yards, and other sites not needed for operational and safety purposes (i.e., the “shoulders” of the pads) would be recontoured to a final or intermediate contour that would blend with the surrounding topography as much as possible. Areas able to be reclaimed would be reseeded with a BLM-approved seed mix. The stockpiled topsoil would also be spread on the area to aid in revegetation where-available.

The following specific BMPs would be established for protection against native soil erosion and reclamation of disturbed areas:

- Site-disturbance on slopes with high erosional potential will be minimized where possible, and appropriate ECDs used where necessary.
- Topsoil would be stripped (typically to the rooting depth) and salvaged during the construction of all pads, as feasible. Salvaged topsoil (and cleared organic material, stumps, brush, and slash, if saved) would be stockpiled on for use during subsequent reclamation of the disturbed areas.
- Soil stockpiles that are to be stored long-term would be stabilized with vegetative cover as soon as is practicable using a BLM-approved seed mix.
- Disturbed areas no longer required for operations would be stabilized by re-establishing vegetative cover using a BLM-approved seed mix.

- The amount of time between soil disturbance and reclamation would be minimized.

5.2. Erosion Control and Stormwater Drainage

A SWPPP would be implemented for the construction activities associated with the Project. The SWPPP would include use of ECDs and other measures designed to prevent sediment from discharging to surface waters. Permanent erosion control measures after construction would include revegetation and periodic maintenance. Disturbed areas that would not be used after construction would be revegetated with the proper seed mixture and planting procedures prescribed by the BLM. Any topsoil enriched in organic material may be stockpiled on previously disturbed areas and applied to enhance areas to be reclaimed by revegetation.

Exclusive of short-term and long-term flow testing wherein fluids would be discharged to the reserve pit, geothermal fluids would not be discharged to the ground under normal drilling, completions, construction, or operating conditions. Further, vertical sections of geothermal wells would be fully-cased to prevent co-mingling of the geothermal fluids with shallow underground aquifers.

Each well pad or surface facility footprint would be prepared and graded to create a level pad. Stormwater runoff from undisturbed areas around the constructed pads would be directed either into a reserve pit, stormwater containment, or back onto undisturbed ground, in a manner consistent with BMPs for stormwater. Stormwater containment structures, where used, will be designed for a 100-year storm. Disturbance boundary erosion mitigation measures, also called ECDs, may include silt fencing, drainage bars, check dams, berms, and/or seeding.

Reserve pits and stormwater containment structures would be constructed in accordance with BMPs identified in the "Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (Gold Book)" (Fourth Edition – Revised 2007).

5.3. Spill Prevention and Containment

<u>Potential Sources of Accidental Spills or Discharges</u>

Geothermal Fluid

Accidental geothermal fluid spills or discharges are unlikely because the wells would be cased, blowout prevention equipment would be utilized, and the geothermal fluid pipeline system would be equipped with pressure, temperature, flow, and fiber optic measurement devices to facilitate optimum compliance, operation, and troubleshooting if required. However, accidental discharges or spills could result from any of the following:

- Loss of well control (blowout);
- Pipeline leak or rupture; or
- Leakage from tanks.

Drilling Fluids

Muds are a mixture of water, non-toxic chemicals, and solid particles used in the drilling operations to lubricate and cool the bit in the hole, to carry cuttings out of the hole, to

maintain the hole condition, and to control formation pressure. Drilling muds are prepared and stored in metal tanks at the drilling site. Waste drilling mud and cuttings are discharged into the reserve pit, which is open and is adequately sized to hold the volume necessary for the operation. Accidental discharges of drilling mud are unlikely, but could occur by:

- Overflow of the reserve pit;
- Reserve pit wall seepage or wall failure;
- Discharge from equipment failure on location; or
- Shallow lost circulation channeling to the surface.

Lubricating or Fuel Oils and Petroleum Products

At this time, no individual facility or operations area is anticipated to require storing greater than 1,320 gallons of petroleum products. If 1,320 gallons of petroleum products are anticipated to be stored at any individual operations area, a Spill Prevention Control and Countermeasure (SPCC) plan would be prepared and submitted to the appropriate agencies.

A discharge of lubricating or fuel oils would probably be very small and from equipment used in the field. To minimize the potential for spills, all petroleum products on-site are labeled, stored, and handled in conformance with applicable federal, state, and manufacturer requirements. All materials except diesel fuel would be stored in the original shipping containers. Diesel fuel is stored in on-board tanks on the drill rig and replenished from a bulk tank truck using an electric transfer pump and hard lines. Supervisors trained in spill prevention, containment, and clean-up would be on-site 24 hours a day and spill control and cleanup kits would be kept on site near potential spill and release locations. Potential locations for accidental spills are:

- Drilling equipment and machinery at and around the drilling location;
- Other miscellaneous equipment and machinery at well site and roads;
- Storage areas; and
- Equipment servicing areas.

Power Plant Working Fluids

ORC power plants will use a “low boiling point” hydrocarbon such as pentane as its working fluid, which will be heated by the geothermal fluid via shell and tube heat exchangers in a closed loop system. Accidental working fluid spills or discharges are unlikely because the working fluid system would be equipped with emergency pressure valves and measurement devices, and regularly inspected during operations and routine maintenance. However, accidental discharges or spills could result from any of the following:

- Unplanned rupture of a safety valve;
- Pipeline leak or rupture; or
- Leakage from tanks.

<u>Plan for Cleanup and Abatement</u>

In the event of discharge of formation fluids, drilling fluids or petroleum products, the person responsible for the operation would immediately contact the Drilling Supervisor to advise them of the spill and conduct an investigation. The Drilling Supervisor would, in turn, call out equipment, regulate field operations, or do other work as applicable for control and cleanup of the spill, as follows:

Action - Small, Containable Spill

If the spill is small (i.e., less than 25 gallons) and easily containable without endangering the watershed, the Drilling Supervisor would direct and supervise complete cleanup and return to normal operations.

Action - Large or Uncontainable Spill

If the spill is larger than 25 gallons, or is not easily contained, endangers, or has entered the watershed, the Drilling Supervisor would proceed to take necessary action to curtail, contain, and clean up the spill, as above, and notify personnel as listed below.

Notification

The Drilling, Construction, or Operations Supervisor would, as quickly as practicable:

- Call out contractor(s), as required.
- Notify the EDR Project Manager.
- Notify the local and state law enforcement agencies if the public safety is threatened.

The EDR Project Manager would notify the following as soon as practical and work closely with them in all phases of the curtailment, containment, and cleanup operations:

Utah Division of Water Rights
1594 West North temple, Suite 220
P.O. Box 146300
Salt Lake City, UT 84114-6300
801.538.7240

UDEQ
DWMRC
P.O. Box 144880
Salt Lake City, UT 84114-4880
801.536.0200
After hours: 801.536.4123

BLM Cedar City Field Office
(within 24 hours of the knowledge of a reportable release)
176 East D.L. Sargent Drive
Cedar City, UT 84721 435.865.3000
National Response Center 800.424.8802

The Drilling, Construction, or Operations Supervisor would also advise the local population and affected property owners if the spill affects residents or property.

<u>Specific Procedures for Spills</u>

For geothermal fluid:

Contain spillage with dikes if possible and haul to disposal site by vacuum or water trucks or dispose of in a manner acceptable to the UDWRi and BLM.

For drilling mud:

Repair reserve pit or contain with dikes. Haul liquid to another reserve pit, available tanks, or approved disposal site.

For petroleum products:

Contain spill with available manpower. Use absorbents and dispose of same in approved disposal area. Spills of petroleum products in excess of 25 gallons must be reported to DWMRC as soon as possible, but no later than the end of the first working day of the release at:

- In-state: 801.536.0200
- Out-of-state: 888.331.6337

For spills described above, EDR would have the source of the spill repaired at the earliest practical time and continue working crews and equipment on cleanup until all concerned agencies are satisfied.

For working fluids:

Fluid flow to the spill area would be shut off using safety valves and any mobile containers would be removed from the spill area. The power plant pads and associated stormwater systems will be designed to contain spilled working fluid, and prevent it from flowing into water courses or confined areas. Spark-proof tools and explosion-proof equipment would be used for clean up, and the spill area approached from up-wind. Spilled working fluid would be diluted with water and mopped up if water-soluble, or if water-insoluble, absorbed with an inert dry material and placed in an appropriate waste disposal container for disposal via a licensed waste disposal contractor according to applicable regulations. For large spills, spillage would be contained and collected with non-combustible, absorbent materials e.g. sand, earth, vermiculite, or diatomaceous earth and placed in containers for disposal via a licensed waste disposal contractor according to applicable regulations.

Confirm notification to agencies and regulatory bodies.

Telephone notification will be confirmed by the EDR Project Manager in writing, within two weeks of telephone notification. Written confirmation would contain:

- Reason for the discharge or spillage.
- Duration and volume of discharge or spillage.
- Steps taken to correct the problem.
- Steps taken to prevent recurrence of problem.

5.4. Health and Safety Program

Construction and operation activities would be conducted in a manner to avoid creating any

hazards to public health and safety. The Project is located outside of residential areas and would not likely cause hazards to public health and safety. Injury contingency, spill or discharge contingency, and H2S contingency plans are provided in this POO.

Drilling and construction operators are required by law to train workers on safety and to have first aid equipment on-site. EDR will supervise the drilling and construction operations to ensure that all safety procedures and best safety practices are in place and adhered to throughout the drilling and construction program. EDR's drilling and construction operations are required to be in compliance with all existing laws pertaining to safety and environmental protection. Safety meetings are held prior to any major operation. Drilling and construction contractors would typically have a daily safety meeting with crews and review any issues that could come up during the crew's work shift.

In the event injuries occur in connection with an EDR operation, specific and immediate attention would be given, along with proper transportation to a nearby medical facility, such as Milford Valley Memorial Hospital:

- Ambulance (911)
- Milford Valley Memorial Hospital
  850 N. Main Street
  Milford, UT 84751

5.5. Vegetation Treatment and Weed Management

A weed management plan would be established, implementing effective BMPs to conserve native ecosystems, mitigate fire risks, and maintain ecological integrity, according to federal and state standards. BMPs are intended to prevent the establishment of noxious and invasive weeds which pose a significant threat to native plant communities, and mitigate the risk of wildfires by preventing uncontrolled vegetative growth on Project disturbance areas.

Routine comprehensive site assessments would be conducted of disturbed areas undergoing reclamation, adhering to the standards established in the SWPPP, EPA guidance, and BLM recommendations (43 CFR Part 1610.4-9). Noxious and invasive weed control would be pursuant to standards established in the BLM Gold Book (Fourth Edition - Revised 2007) H-1740-2, the Federal Noxious Weed Act of 1974, and the Utah Noxious Weed Act. Additional area-specific support regarding chemical spraying procedures and scheduling is provided through the Beaver County Noxious Weed Control Board.

The following specific BMPs would be established for noxious and invasive weed control:

- Noxious weed infestations would be identified during routine site assessments.
- Where noxious weeds are discovered, these areas would be avoided where possible to limit their spread, and the infested areas treated using an EPA-approved, BLM-approved, and livestock-safe herbicide by a licensed applicator. Treatments on federal surface will be reported to the BLM's noxious weed coordinator.
- All vehicles, earth-moving construction equipment, mobile trailers, and RV campers would be power-washed prior to arriving in the Project area.

- Seed mixes for the rehabilitation and/or re-vegetation of all disturbed areas related to the Project would be certified as weed-free, per BLM standards.
- If needed, certified noxious weed-free hay bales, straw bales, or other weed-free ECDs would be purchased and used on the Project site.

5.6. Waste and Hazardous Materials Management

Construction/Maintenance Debris

Conventional trash generated during drilling, construction, operations, and routine maintenance would be contained on-site in covered trash receptacles and hauled to an approved landfill. Burial of trash on-site will not be permitted.

Hydrogen Sulfide Contingency Plan

Non-condensable gas (NCG) concentrations within geothermal systems can vary greatly and depend on the temperature, geologic setting, and rock types. The Project is considered a non-magmatic, low-enthalpy type geothermal system, so it is reasonable to assume hydrogen sulfide concentrations are low and do not need abatement. During drilling, well control practices keep the geothermal fluids in the reservoir, preventing any exposure pathway. During flow tests, brine is directed to a flash vessel which directs steam and exsolved NCGs, such as H2S, upwards and well above head level. Additionally, the steps below would be taken to help prevent exposure to H2S during drilling and testing:

- Although there is very little chance that drilling in these moderate-temperature geothermal reservoirs would encounter substantial H2S, continuous H2S monitors would be on the rig floor and at the mud tanks and shaker to alert workers should elevated H2S levels be detected. Signs would be posted to inform workers and visitors of any potential issues.
- Drilling parameters would be continuously monitored, and any changes in gas concentrations, formation pressures, or potential for flow are provided to the driller and supervisor. The blowout prevention equipment would be in place to shut off any unexpected gas flows. In the event any evidence of high gas concentrations are detected in the drilling fluids, the drilling fluids consultant would obtain materials and design a program to safely circulate out the gas bubble and to treat and remove any H2S using caustic soda, peroxide, soda ash, lime, or other technology as appropriate.

Naturally Occurring Radioactive Materials (NORM)

There is no known source of elevated NORM at the Project, such as young marine shales or potassium-rich granitic bodies. The main rock units in the Project area include granite, gneiss, basalt, diorite, rhyolite, and alluvium. As such, exposure to NORM is not considered a concern.

5.7. Visual Resource Management

Where appropriate, fixed structures and fixed equipment on federal property will use appropriately-colored materials, stains, or coatings in an effort to blend with the Project area's visual backdrop. The BLM's Standard Environmental Color Tool Entire Set (PC01) will be

consulted when choosing structure and equipment colors, to best adhere to the BLM's VRM guidelines.

Detailed facility designs would include a lighting and noise study on the final power plant configuration. Ambient overnight lighting would be minimized to only areas required for safe operations or regulatory requirements. Where necessary, ambient lighting would be designed to cause minimal light outside the operating area.

5.8. Fire Prevention and Control

The following wildfire prevention and response measures around the sub-transmission lines, transmission line, switchyard transformers, and associated electrical equipment would be employed.

- Any small fires which occur around the well pad, power plant, or switchyard during drilling, construction, or power generation operations should be able to be controlled by on-site personnel utilizing on-site firefighting equipment.
- The BLM Cedar City Field Office (435.865.3000) would be notified of any wildland fire, even if the available personnel can handle the situation or the fire poses no threat to the surrounding area. Additionally, the Color Country Interagency Fire Center (435.865.4611).
- A roster of emergency phone numbers would be available on-site so that the appropriate firefighting agency can be contacted in case of a fire.
- All vehicles traveling off road will carry at a minimum a conventional fire extinguisher.
- Adequate firefighting equipment (a shovel, a Pulaski or other trenching tool, standard fire extinguisher(s), and at least a 100-gallon water tank with pump) will be kept readily available at each active drill site.
- Vehicle catalytic converters (on vehicles that would enter and leave the drill site on a regular basis) will be inspected often and cleaned of all flammable debris.
- All cutting/welding torch use, electric-arc welding, and grinding operations will be conducted in an area free, or mostly free, from vegetation. At least a 100-gallon water tank with pump and shovel will be on hand to extinguish any fires created from sparks. A welding tent would be used, as appropriate. At least one person in addition to the cutter/welder/grinder will be at the work site to promptly detect fires created by sparks.
- Personnel would be responsible for being aware of and complying with the requirements of any fire restrictions or closures issued by the BLM Cedar City Field Office, as publicized in the local media or posted at various sites throughout the field office district.
- Pad sites would be monitored for excessive build-up of noxious weeds, including accumulated russian thistle, which can pose a fire hazard. Noxious weeds will be disposed of properly to prevent unwanted spread. Areas of noxious weeds within project operating areas would be treated as described in Section 5.5.

5.9. Wildlife Protection

To prevent undue degradation and removal of habitat, cover, and food, existing roads would be used whenever possible and cross-country travel would be restricted to designated

construction areas. Speed limits of 25 miles per hour would be observed on all unpaved roads in the Project area to minimize dust and avoid collision and incidental death of local wildlife.

Exclusionary fencing where-required (including well pad reserve pits, power plants, and switchyard), eight-foot exclosure fencing will be utilized to prevent access by persons, wildlife, or livestock. Exclosure fencing would consist of chain-link fence or other BLM-approved fencing recommendations. To prevent livestock, wildlife, and persons from becoming entrapped, one side of the reserve pit walls would be sloped at an approximate 30 percent incline.

Where additional non-exclusionary fencing is necessary, EDR would use fencing consistent with the UDWR-recommended specifications for wildlife, including compatibility with big game species.

Equipment would be inspected prior to operation to ensure no wildlife are located in or near the equipment. If big game species enter the work area during construction, work would stop until the big game species have exited the work area.

EDR has cooperated with Utah Division of Wildlife Resources (UDWR) to contribute to a project to mitigate any potential impacts to pronghorn and other big game species that may utilize the AOI, which would enhance habitat quality for big game species within the Milford Valley area.

To prevent a violation of the Migratory Bird Treaty Act and per lease stipulations, EDR would contract a qualified wildlife biologist to conduct a pre-construction survey for nesting migratory birds during the breeding season (March 15 – July 31 for non-raptors and January 1 - August 31 for raptors) prior to any ground clearing or other surface disturbance. The survey would include the proposed footprint of disturbance and an appropriate-sized buffer area. If disturbance is not completed within the timeframe established as a condition in the Geothermal Drilling Permit for the preconstruction survey, an additional survey may be required after consultation with the BLM. If active nests are found, and in consultation with the BLM, an appropriately sized buffer would be established to exclude any disturbance around the nest until the nesting attempt has been completed. If active nests are not found, surface disturbance activities would occur within the survey validity time frame.

Transmission and overhead sub-transmission lines will be constructed per APLIC recommendations and/or Avian Protection Plan Guidelines to minimize electrocutions and collisions. Guyed structures will be equipped with avian/bat diverters at sufficient intervals to minimize the potential for impacts associated with bird/bat strikes. Perch deterrents may be utilized to reduce avian predation and would be approved by the BLM Authorized Officer.

5.10. Cultural Resource Protection

Cultural resource surveys have been conducted on the Project area. In consultation with the BLM and with the Utah State Historic Preservation Office (USHPO) concurrence, any areas that contain cultural resources of significance or whose eligibility for inclusion on the National Register of Historic Places is unevaluated, would be mitigated or “treated” and recorded as appropriate. Mitigation measures include avoidance buffers and fencing. EDR employees, contractors, and suppliers would be reminded that all cultural resources are protected and if

uncovered, the resource would be left in place, work would cease, and notification would be made to the EDR representative and the appropriate BLM authorized officer by telephone, with written confirmation to follow, immediately upon such discovery. For areas where an existing road traverses a contributing concentration, all vehicle traffic would remain within the confines of the existing access road.

5.11. Fossil Resources

As the Project area straddles the maximal shoreline of ancestral Lake Bonneville, the possibility exists for Pleistocene-aged megafauna fossils within the Project area. If fossil resources are inadvertently exposed through Project excavation activity on BLM-managed lands, the Cedar City Field Office will be immediately notified and the excavation work at the location will be temporarily suspended until the fossil find can be evaluated and recorded.

5.12. Minimization of Air Pollution

EDR would comply with any air quality requirements prescribed by the Utah Division of Air Quality (UDAQ) as well as those requirements stipulated by the BLM. The following air quality mitigation measures would be adhered to:

- All internal combustion equipment would be kept in good working order.
- Open burning of garbage or refuse would not occur at well sites or other facilities.
- Drill rigs would be equipped with Tier II or better diesel engines.
- Stationary internal combustion engines would comply with the following standards: 2g NOx/bhp-hr for engines less than 300 horsepower, and 1g NOx/bhp-hr for engines greater than 300 horsepower.
- No natural gas flaring, natural gas stock tanks, or triethylene glycol (TEG) dehydrators will be required during completion.
- Low bleed or no bleed pneumatics would be installed on separator dump valves or other controllers.
- Well site telemetry would be utilized, as feasible, for production operations.
- Any fixed generators will be permitted as-required by state and local regulation through UDAQ and Beaver County.
- Water would be applied to the ground during the construction and utilization of the well pads and access roads, as necessary to control fugitive dust.
- A speed limit of 25 miles per hour will be observed on unpaved, or untreated, roads in the Project area to limit fugitive dust.

5.13. Minimization of Noise Pollution

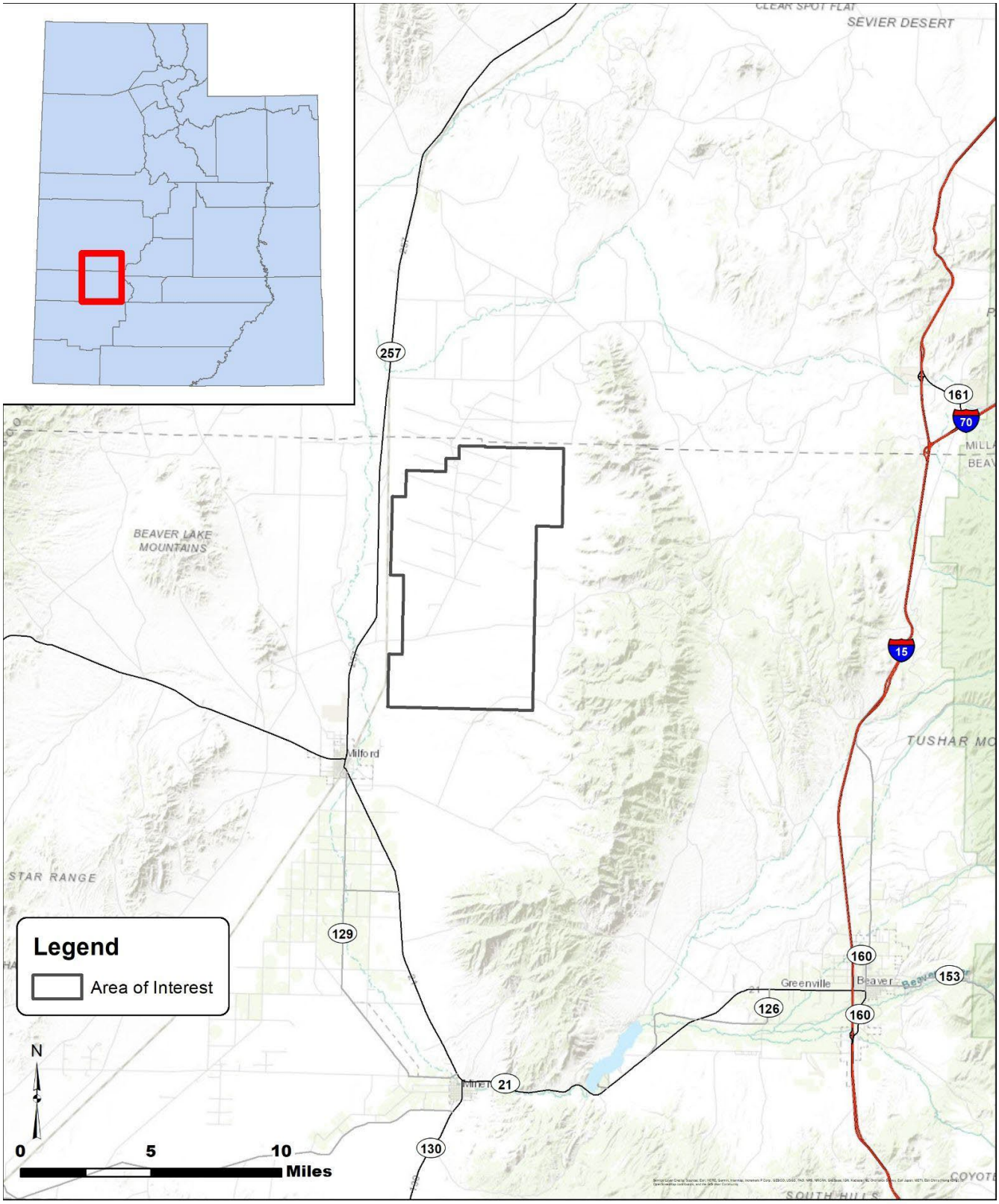
BLM regulations mandate that noise at one-half mile—or at the lease boundary, if closer—from a major geothermal operation will not exceed 65 A-weighted decibels (43 CFR 3200.4[b]). To abate noise pollution, mufflers would be used on all drilling rig engines. The rock mufflers needed to abate noise created by steam during conventional geothermal well testing, are not required for EDR's well testing programs. However, during permitted operations where

compressed air drilling methods are utilized, rock mufflers could be used to attenuate noise produced from steam venting. These are approximately 30 feet tall and approximately 10 feet in diameter. All operations would be performed in a manner consistent with federal, state, county noise regulations as well as conform with any noise pollution lease stipulations attached to the portion of federal lands on which the operations are occurring.

Existing noise in the Project area is dominated by vehicles traveling on nearby roads, aircraft overflights, and natural ambient sources including wind and animal calls. The baseline noise levels are assumed to be consistent with similar rural environments, ranging from below 30 dBA to above 50 dBA. There are no sensitive receptors (i.e., hospital, residence, school, church, recreation site, wildlife protection area) in the immediate vicinity (within one mile) of the Project area.

FIGURES

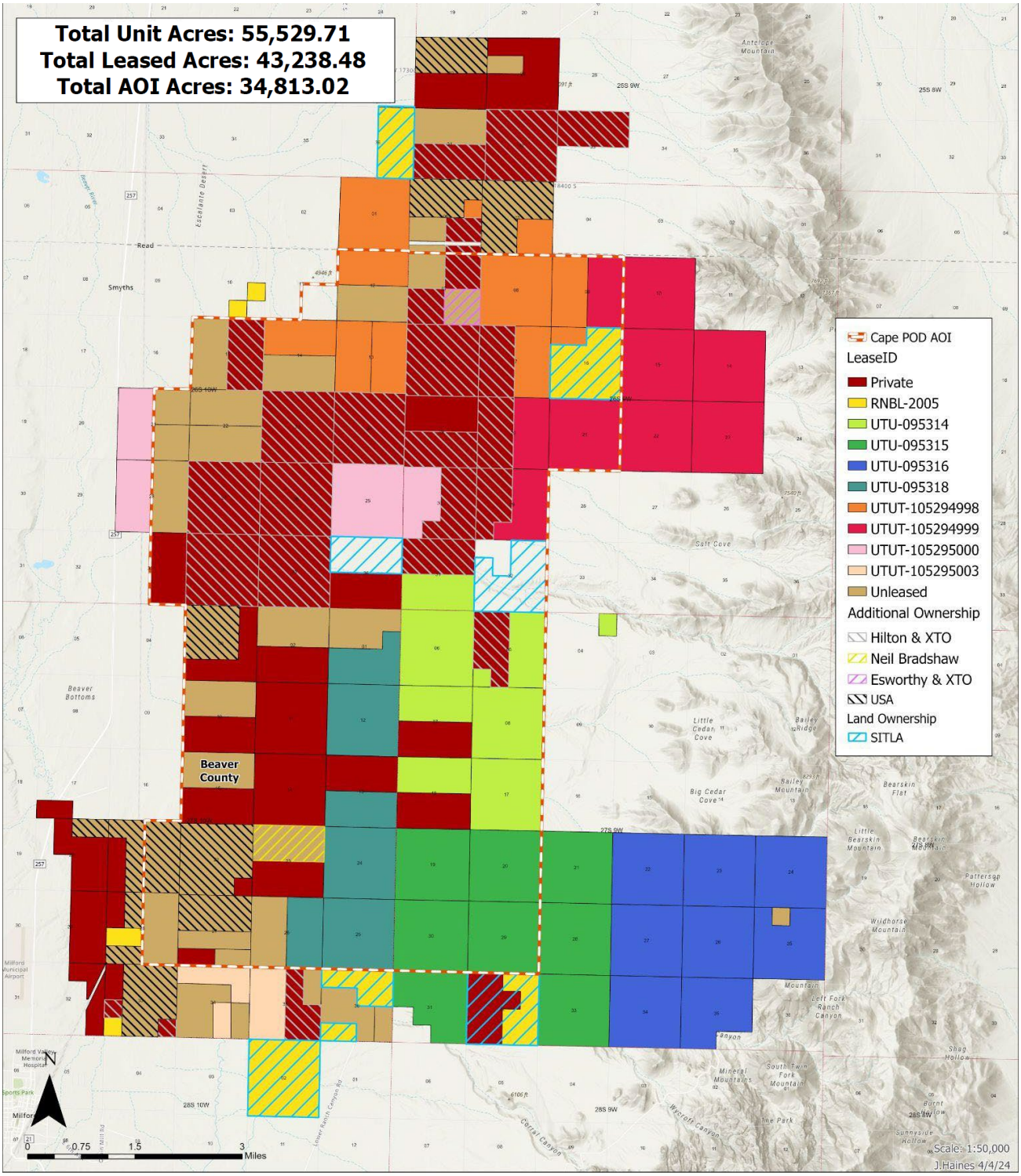
Figure 1: Project AOI Location Map



Cape Modern Geothermal Development Project
Beaver County, Utah
May 2024

FERVO ENERGY

Figure 2: Geothermal Lease Unit Detail Map

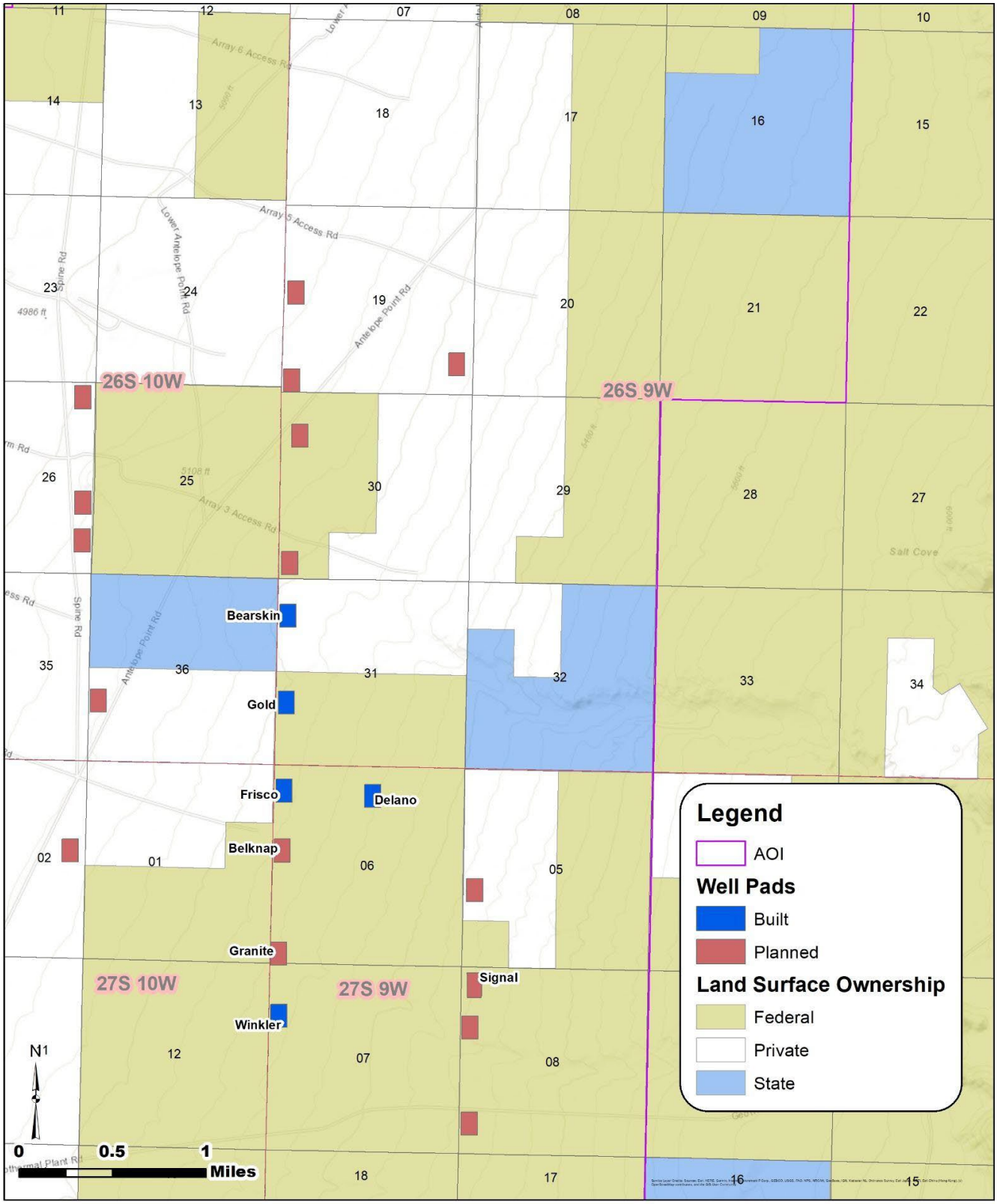


Project Cape Leases

Beaver County, UT

FERVO ENERGY

Figure 3: Project Overview Map, Well Field Development



Cape Modern Phase I & II Well Development Plan
Beaver County, Utah
May 2024

FERVO ENERGY

Figure 4: Project Overview Map, Surface Facility Development

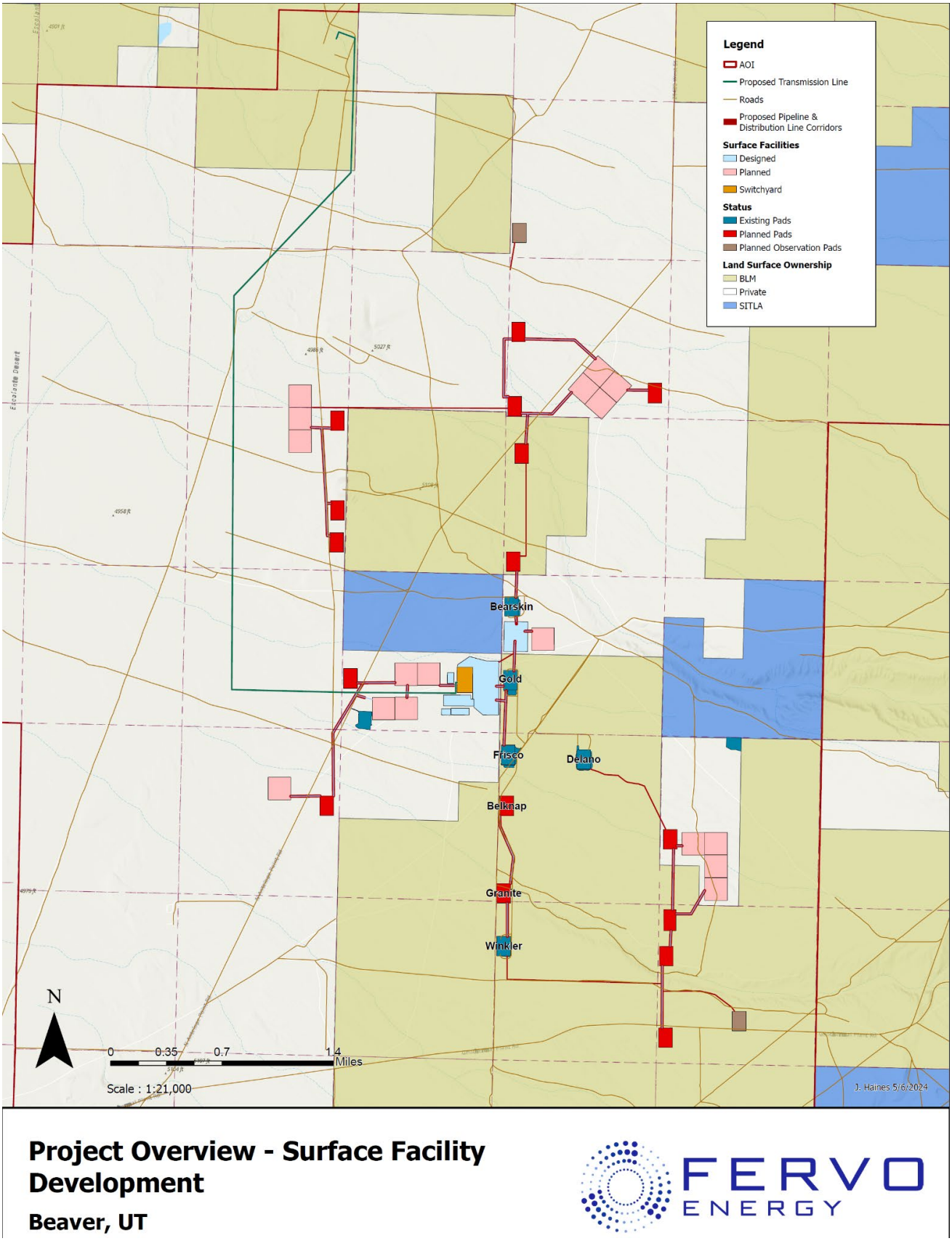
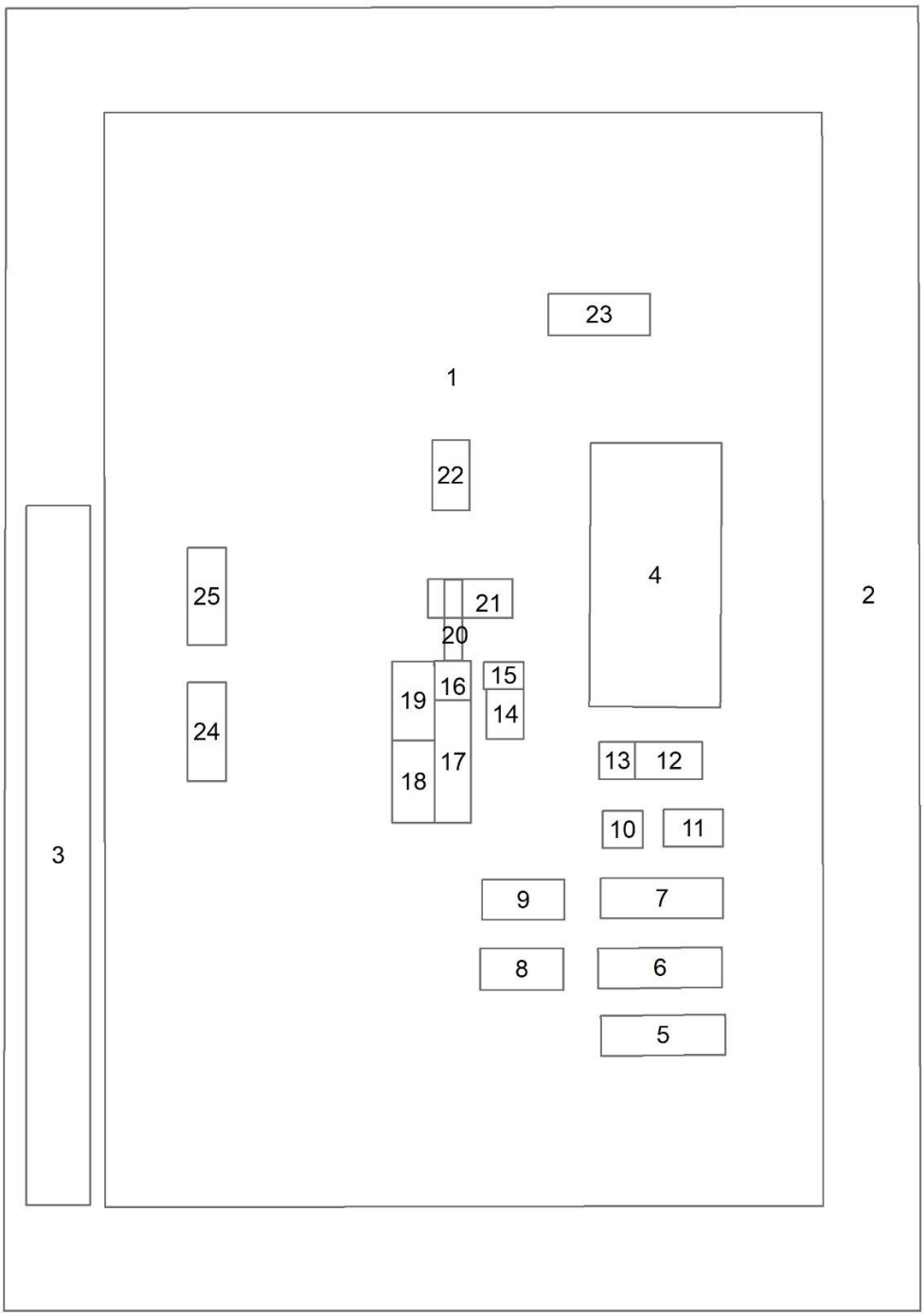


Figure 5: Concept Well Pad Layout During Well Drilling Operations



1. Pad
2. Outer Pad
3. Topsoil Stockpile
4. Reserve Pit
5. Air Compressor
6. Air Compressor
7. Mud Tank
8. Fuel Tank
9. Water Tank
10. Mud Storage
11. Generator
12. Change House
13. Accumulator
14. Mud Pit
15. Shale Shaker
16. Rig Floor
17. Draw Works
18. Storage
19. Dog House
20. Catwalk
21. Pipe Rack
22. Electric Logger
23. Mud Logger
24. Trailer House
25. Trailer Office

Figure 6: Initial Construction Detail Map, Switchyard and Power Plants 1, 2, & 3

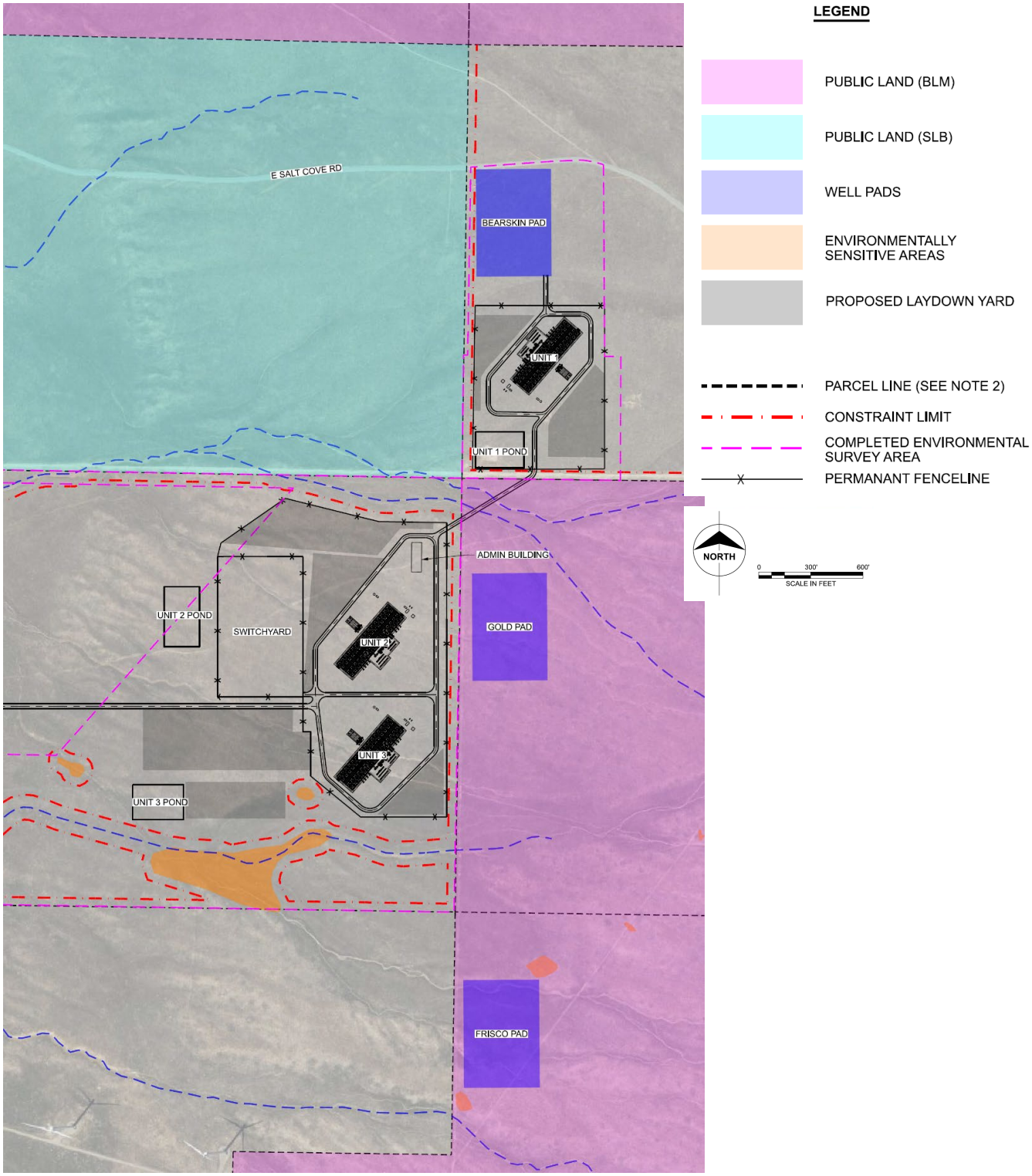


Figure 7: Concept Power Plant Schematic

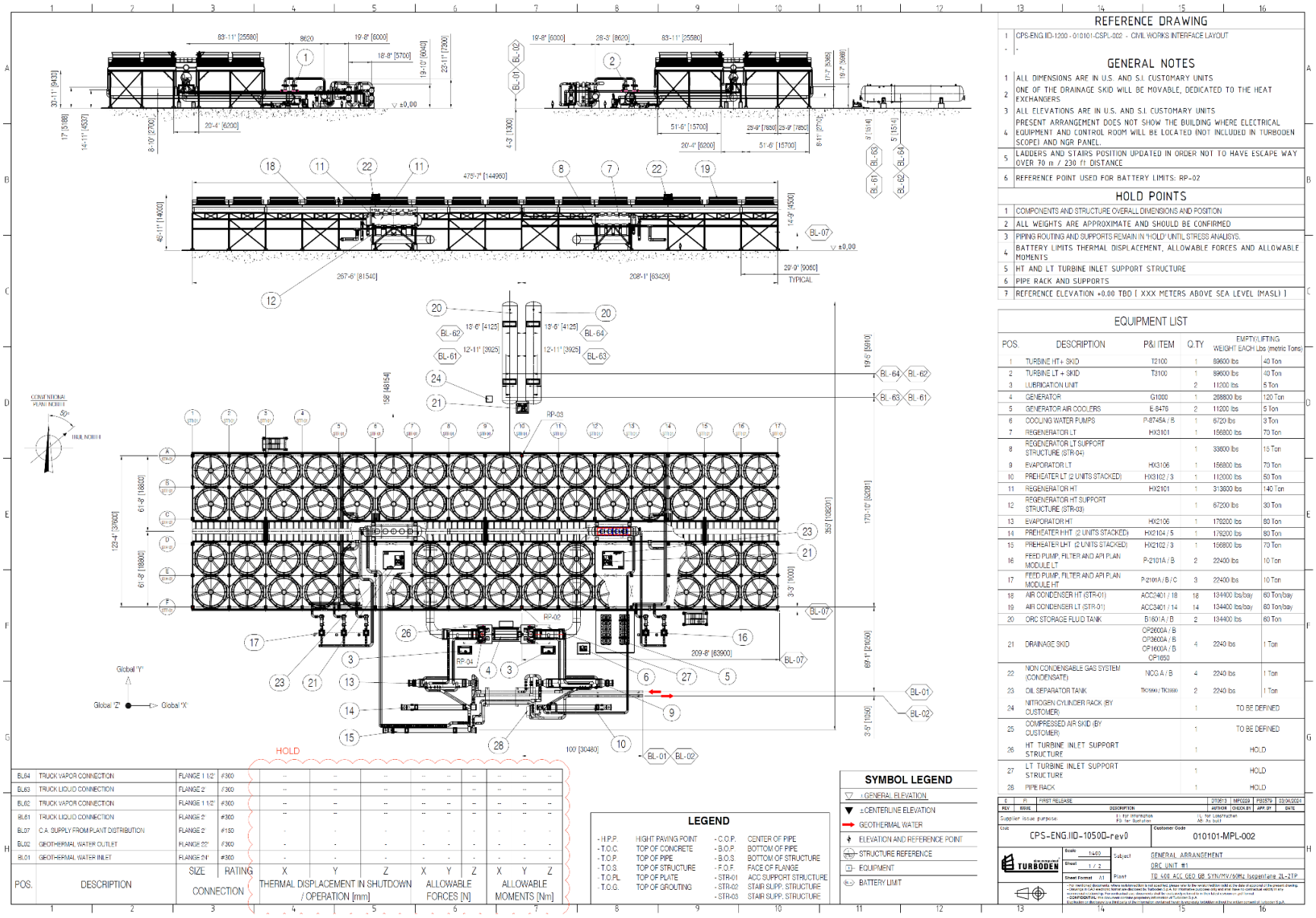


Figure 8: Transmission Line Route

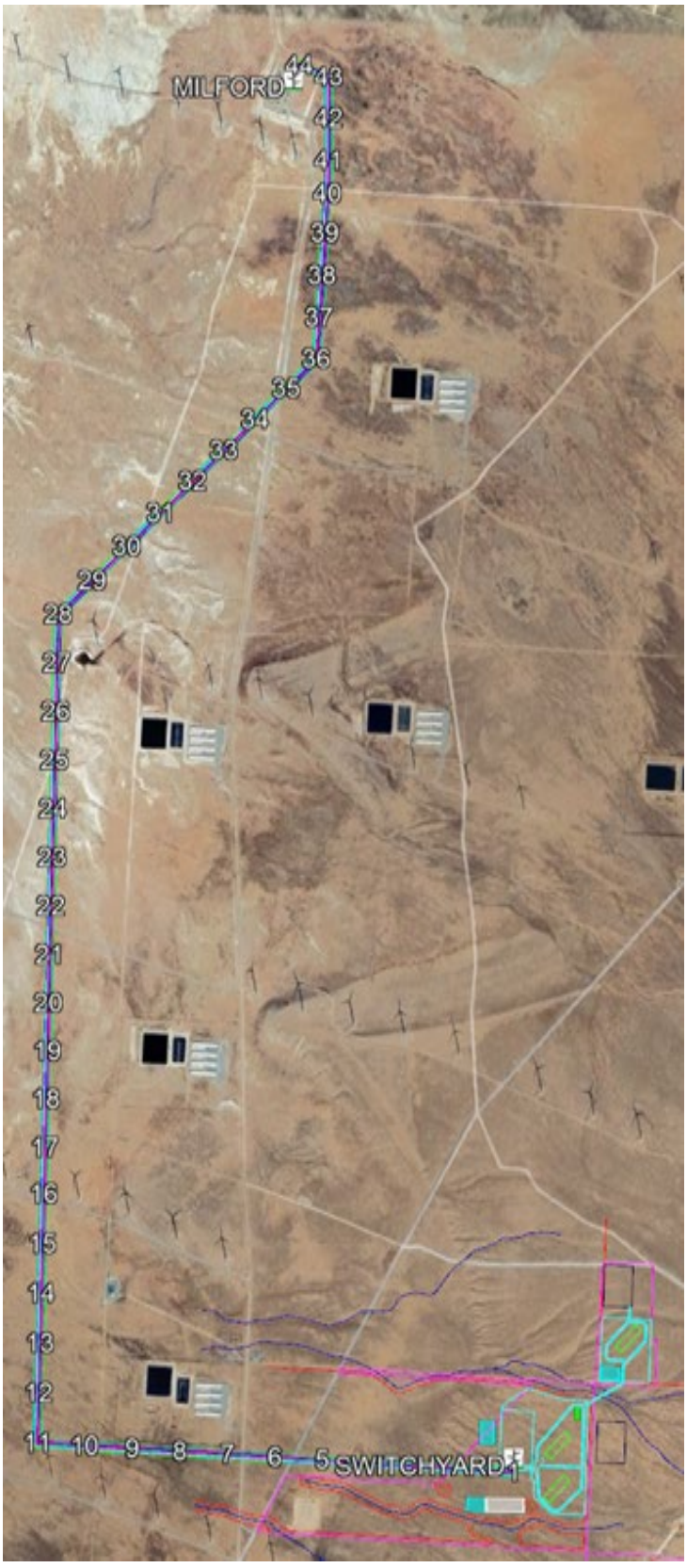


Figure 9: Concept H-Frame Tangent Structure, Transmission Line

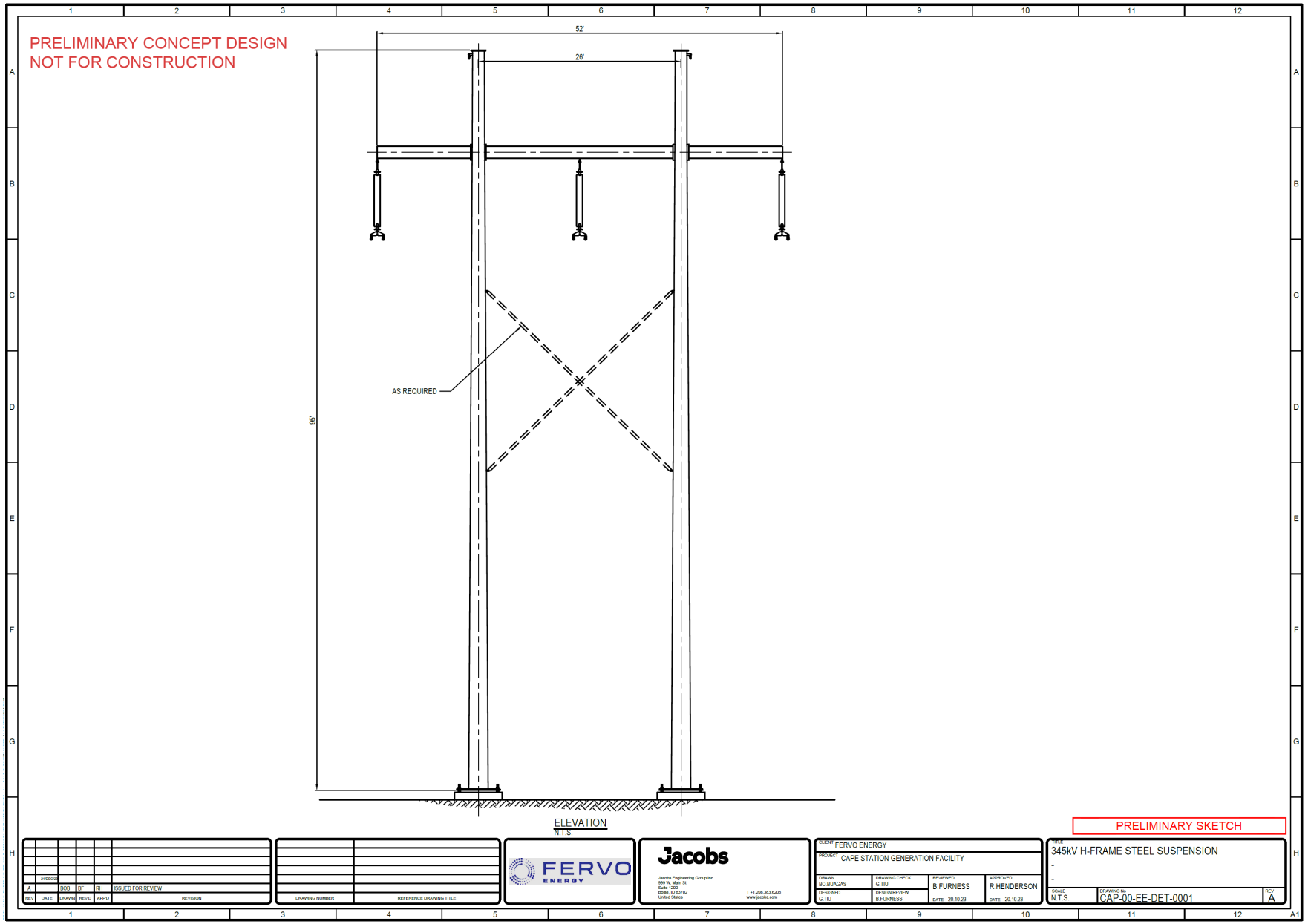


Figure 10: Concept Switchyard Layout, Overhead View

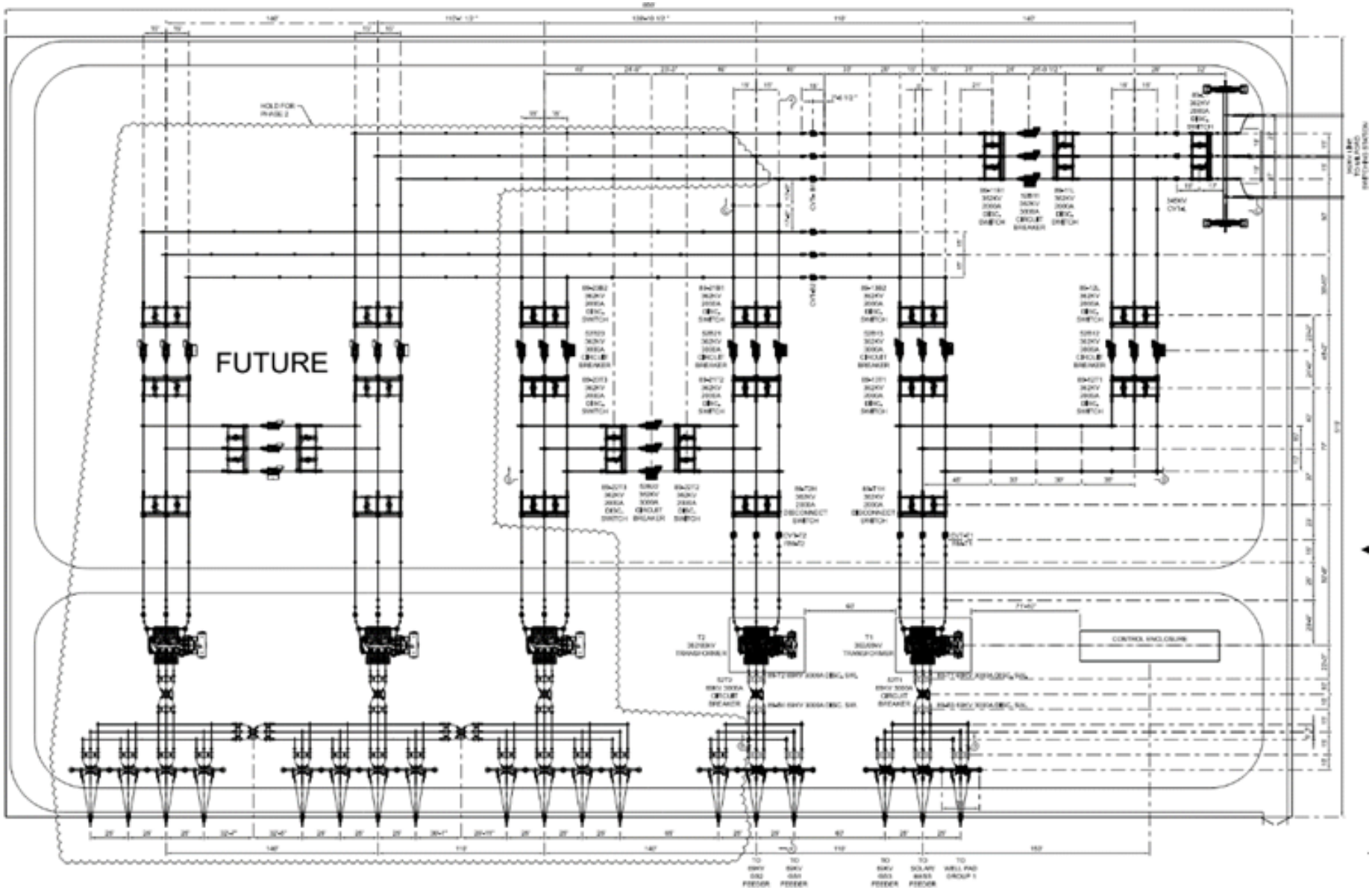
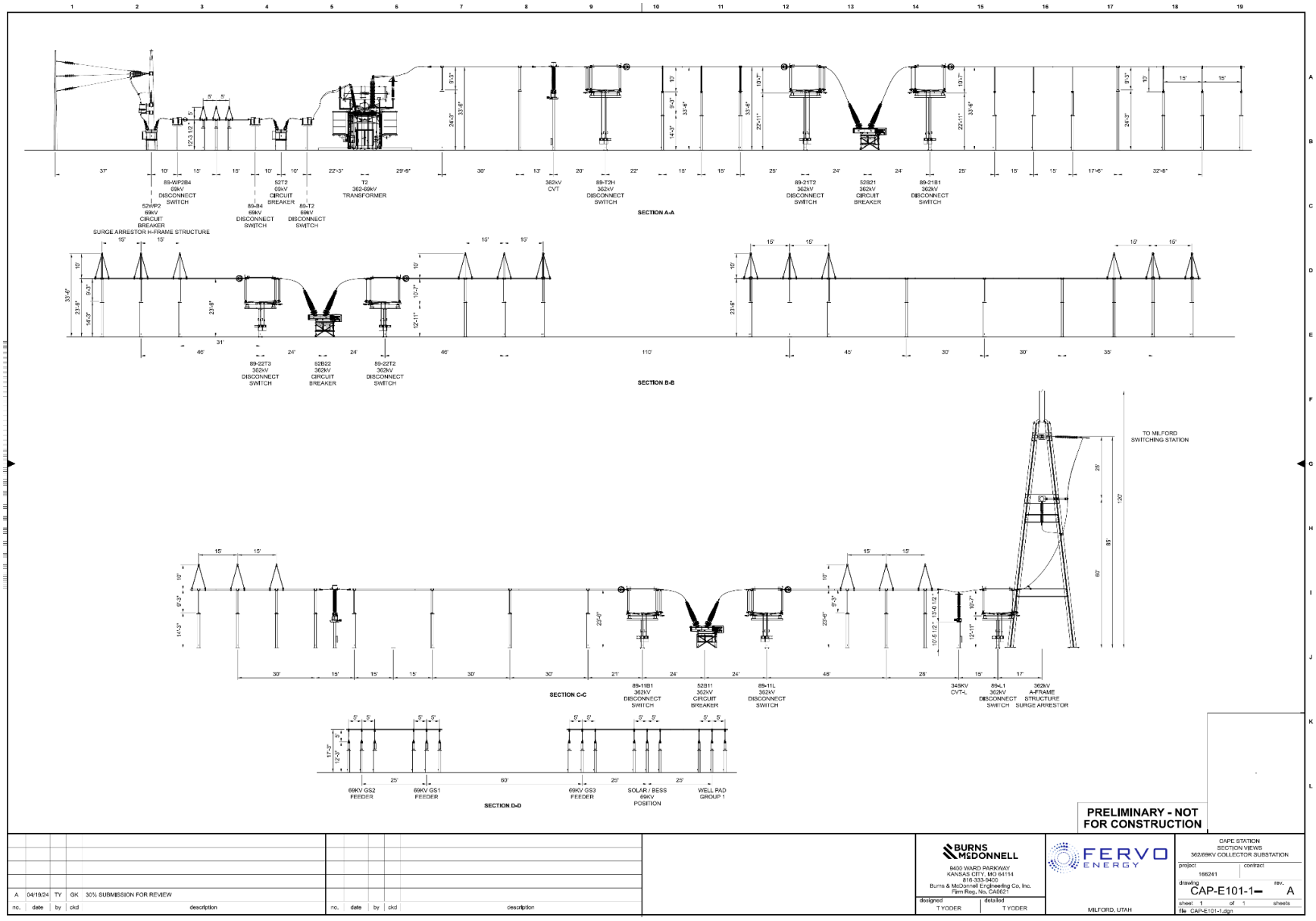


Figure 11: Concept Switchyard Layout, Sectional Views



APPENDIX B

Summary of Geothermal Leases within the AOI

Federal Geothermal Leases within the AOI

Lease Number	Township and Range	Section Number(s)	Acreage
UTU-95314	T.27S., R.9W.	All or portions of Sections 05, 06, 07, 08, 17, 18	2,974.86
UTU-95314	T.26S., R.9W.	All or portions of Sections 31	326.78
UTU-95318	T.27S., R.10W.	All or portions of Sections 01, 12, 13, 24, 25, 26	2,920.00
UTU-95315	T.27S., R.9W.	All of Sections 19, 20, 29, 30	2,560.00
UTU-105294998	T.26S., R.9W.	All or portions of Section 17	320.00
UTU-105294998	T.26S., R.10W.	All or portions of Sections 13, 14	960.00
UTU-105294998	T.26S., R.9W.	All or portions of Section 08	640.00
UTU-105294998	T.26S., R.9W.	All or portions of Section 09	320.00
UTU-105294999	T.26S., R.9W.	All or portions of Sections 20, 29	680.00
UTU-105294999	T.26S., R.9W.	All or portions of Section 9	320.00
UTU-105294999	T.26S., R.9W.	All or portions of Section 21	640.00
UTU-105295000	T.26S., R.9W.	All or portions of Section 30	280.00
UTU-105295000	T.26S., R.10W.	All or portions of Section 25	640.00

Private Geothermal Leases within AOI

Lease Name	Township and Range	Section Number(s)	Acreage
UT_Cape_Armstrong	T.27S., R.9W.	All or portions of Section 07	329.11
UT_Cape_Armstrong	T.27S., R.10W.	All or portions of Section 13	320.00
UT_Cape_Wright	T.27S., R.10W.	All or portions of Section 18	330.50
UT_Cape_Smithfield	T.27S., R.9W.	All or portions of Section 05	299.83
UT_Cape_Hilton*	T.27S., R.9W.	All or portions of Section 05	*Split Minerals under Smithfield

Lease Name	Township and Range	Section Number(s)	Acreage
UT_Cape_XTO*	T.27S., R.9W.	All or portions of Section 05	*Un-leased Split Minerals under Smithfield
UT_Cape_Smithfield	T.26S., R.9W.	All or portions of Section 08	160.00
UT_Cape_Hilton*	T.26S., R.9W.	All or portions of Section 08	*Split Minerals under Smithfield
UT_Cape_XTO*	T.26S., R.9W.	All or portions of Section 08	*Un-leased Split Minerals under Smithfield
UT_Cape_Machris	T.26S., R.10W.	All or portions of Section 36	320.00
UT_Cape_Smithfield	T.26S., R.10W.	All or portions of Section 24	640.00
UT_Cape_Hilton*	T.26S., R.10W.	All or portions of Section 24	*Split Minerals under Smithfield
UT_Cape_XTO*	T.26S., R.10W.	All or portions of Section 24	*Un-leased Split Minerals under Smithfield
UT_Cape_Smithfield	T.26S., R.9W.	All or portions of Section 19	640.00
UT_Cape_Hilton*	T.26S., R.9W.	All or portions of Section 19	*Split Minerals under Smithfield
UT_Cape_XTO*	T.26S., R.9W.	All or portions of Section 19	*Un-leased Split Minerals under Smithfield
UT_Cape_Smithfield	T.26S., R.9W.	All or portions of Section 18	640.00
UT_Cape_Hilton*	T.26S., R.9W.	All or portions of Section 18	*Split Minerals under Smithfield
UT_Cape_XTO*	T.26S., R.9W.	All or portions of Section 18	*Un-leased Split Minerals under Smithfield
UT_Cape_Smithfield	T.26S., R.9W.	All or portions of Section 17	320.00

Lease Name	Township and Range	Section Number(s)	Acreage
UT_Cape_Hilton*	T.26S., R.9W.	All or portions of Section 17	*Split Minerals under Smithfield
UT_Cape_XTO*	T.26S., R.9W.	All or portions of Section 17	*Un-leased Split Minerals under Smithfield
UT_Cape_Smithfield	T.26S., R.9W.	All or portions of Section 18	640.00
UT_Cape_Hilton*	T.26S., R.9W.	All or portions of Section 18	*Split Minerals under Smithfield
UT_Cape_XTO*	T.26S., R.9W.	All or portions of Section 18	*Un-leased Split Minerals under Smithfield
UT_Cape_Smithfield	T.26S., R.10W.	All or portions of Section 14	320.00
UT_Cape_Smithfield	T.26S., R.10W.	All or portions of Section 13	320.00
UT_Cape_Hilton*	T.26S., R.10W.	All or portions of Section 13	*Split Minerals under Smithfield
UT_Cape_XTO*	T.26S., R.10W.	All or portions of Section 13	*Un-leased Split Minerals under Smithfield
UT_Cape_Smithfield	T.26S., R.10W.	All or portions of Section 13	320.00
UT_Cape_Hilton*	T.26S., R.10W.	All or portions of Section 13	*Split Minerals under Smithfield
UT_Cape_XTO*	T.26S., R.10W.	All or portions of Section 13	*Un-leased Split Minerals under Smithfield
UT_Cape_Smithfield	T.26S., R.10W.	All or portions of Section 26	640.00
UT_Cape_Hilton*	T.26S., R.10W.	All or portions of Section 26	*Split Minerals under Smithfield
UT_Cape_XTO*	T.26S., R.10W.	All or portions of Section 26	*Un-leased Split Minerals

Lease Name	Township and Range	Section Number(s)	Acreage
			under Smithfield
UT_Cape_Smithfield	T.26S., R.10W.	All or portions of Section 23	640.00
UT_Cape_Hilton*	T.26S., R.10W.	All or portions of Section 23	*Split Minerals under Smithfield
UT_Cape_XTO*	T.26S., R.10W.	All or portions of Section 23	*Un-leased Split Minerals under Smithfield
UT_Cape_Smithfield	T.26S., R.10W.	All or portions of Section 27	640.00
UT_Cape_Hilton*	T.26S., R.10W.	All or portions of Section 27	*Split Minerals under Smithfield
UT_Cape_XTO*	T.26S., R.10W.	All or portions of Section 27	*Un-leased Split Minerals under Smithfield
UT_Cape_Smithfield	T.26S., R.10W.	All or portions of Section 35	640.00
UT_Cape_Hilton*	T.26S., R.10W.	All or portions of Section 35	*Split Minerals under Smithfield
UT_Cape_XTO*	T.26S., R.10W.	All or portions of Section 35	*Un-leased Split Minerals under Smithfield
UT_Cape_Smithfield	T.26S., R.10W.	All or portions of Section 34	640.00
UT_Cape_Hilton*	T.26S., R.10W.	All or portions of Section 34	*Split Minerals under Smithfield
UT_Cape_XTO*	T.26S., R.10W.	All or portions of Section 34	*Un-leased Split Minerals under Smithfield
UT_Cape_Smithfield	T.26S., R.10W.	All or portions of Section 33	320.00
UT_Cape_Smithfield	T.26S., R.10W.	All or portions of Section	320.00

Lease Name	Township and Range	Section Number(s)	Acreage
UT_Cape_Hilton*	T.26S., R.10W.	All or portions of Section 13	*Split Minerals under Smithfield
UT_Cape_XTO*	T.26S., R.10W.	All or portions of Section 13	*Un-leased Split Minerals under Smithfield
UT_Cape_Smithfield	T.27S., R.10W.	All or portions of Sections 2,3,10,11	1,560.00
UT_Cape_Yardley	T.27S., R.10W.	All or portions of Sections 14,15,21,22,23,26,27,28	3,680.00
UT_Cape_Keller	T.27S., R.10W.	All or portions of Section 2	320.00
UT_Cape_Rule	T.26S., R.10W.	All or portions of Section 32	40.00

STIPULATIONS

HQ-ESA: THREATENED AND ENDANGERED SPECIES ACT

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

HQ-CRP: CULTURAL RESOURCE PROTECTION

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

UT-GEO-S-01: NO SURFACE OCCUPANCY – NATIONAL REGISTER OF HISTORIC PLACES, CULTURAL RESOURCES (SITES, STRUCTURES, OBJECTS, AND TRADITIONAL USE AREAS)

In accordance with the No Surface Occupancy Lease Stipulations in Section 2.3.2 of the December 2008 Bureau of Land Management Record of Decision for the Geothermal Leasing Environmental Impact Statement and the suggested mitigating measures, No Surface Occupancy within the boundary of properties designated or eligible for the National Register of Historic Places, including National Landmarks and National Register Districts and Sites, and additional lands outside the designated boundaries to the extent necessary to protect values where the setting and integrity is critical to their designation or eligibility.

Exception: The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource and/or the resource the resource is no longer National Register quality. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated negative impacts. An exception may be granted for actions designed to enhance the long-term utility or availability of the cultural resources.

Modification: The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

STIPULATIONS (Cont.)

UT-GEO-S-01: NO SURFACE OCCUPANCY – NATIONAL REGISTER OF HISTORIC PLACES, CULTURAL RESOURCES (SITES, STRUCTURES, OBJECTS, AND TRADITIONAL USE AREAS) (Cont.)

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource, or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

UT-GEO-S-02: NO SURFACE OCCUPANCY – TRADITIONAL CULTURAL PROPERTIES

In accordance with the No Surface Occupancy Lease Stipulations in Section 2.3.2 of the December 2008 Bureau of Land Management Record of Decision for the Geothermal Leasing Environmental Impact Statement and the suggested mitigating measures, No Surface Occupancy within areas with important cultural and archaeological resources, such as traditional cultural properties and Native American sacred sites, as identified through consultation.

Exception: None.

Modification: The Authorized Officer may modify the size and shape of the restricted area if through consultation and cultural analysis indicates the traditional cultural properties resource differs or changes.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource, or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

UT-GEO-S-03: NO SURFACE OCCUPANCY – RIPIARIAN HABITAT

No Surface Occupancy (NSO) on and within riparian-wetland vegetated areas to protect the values and functions of these areas. To protect the values and functions of riparian and wetland areas based on the nature, extent, and value of the area potentially affected.

Exception: The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated negative impacts. An exception may be granted for actions designed to enhance the long-term utility or availability of the riparian habitat.

Modification: The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource, or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

STIPULATIONS (Cont.)

UT-GEO-S-04: CONTROLLED SURFACE USE – RIPIARIAN HABITAT BUFFER

Controlled Surface Use (CSU) will be applied within 500 feet of riparian-wetland vegetation to protect the values and functions of these areas. An engineering plan or a study may be required by the operator that identifies the extent of the resource or how the resource will be managed or protected. To protect the values and functions of riparian and wetland areas based on the nature, extent, and value of the area potentially affected.

Exception: The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated negative impacts. An exception may be granted for actions designed to enhance the long-term utility or availability of the riparian habitat.

Modification: The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource, or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

UT-GEO-S-08: NO SURFACE OCCUPANCY– WATER BODIES, WETLANDS, AND/OR 100-YEAR FLOODPLAINS

No Surface Occupancy (NSO) on water bodies, wetlands and/or 100-year floodplains.

Exception: The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated negative impacts. An exception may be granted for actions designed to enhance the long-term utility or availability of the water bodies, wetlands, and/or 100-year floodplains resource.

Modification: The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource, or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

STIPULATIONS (Cont.)

UT-S-239: TIMING LIMITATION – SEASONAL MULE DEER HABITAT

In order to protect important seasonal mule deer habitat, exploration, drilling, and other development activity will be allowed only during the period from May 1 through December 30. This limitation does not apply to maintenance and operation of producing wells.

Exception: Exceptions to this limitation in any year may be specifically approved in writing by the authorized officer of the BLM.

Modification: None
Waiver: None

UT-S-240: TIMING LIMITATION – CRUCIAL DEER WINTER RANGE

In order to protect the crucial Deer Winter Range, exploration, drilling, and other development activity will be allowed during the period from May 1 through December 30. This imitation does not apply to maintenance and operation of producing wells.

Exception: (Cedar City only) Exceptions to this imitation in any year may be specifically authorized in writing by the authorized officer of the BLM.

Modification: None
Waiver: None

NOTICES

UT-GEO-LN-03: PALEONTOLOGICAL AND CULTURAL RESOURCES

Before any specific permits are issued under leases, treatment of cultural resources will follow the procedures established by the Advisory Council on Historic Preservation for compliance with Section 106 of the National Historic Preservation Act. A pedestrian inventory will be undertaken of all portions that have not been previously surveyed or are identified by BLM as requiring inventory to identify properties that are eligible for the National Register of Historic Places (NRHP). Those sites not already evaluated for NRHP eligibility will be evaluated based on surface remains, subsurface testing, archival, and/or ethnographic sources. Subsurface testing will be kept to a minimum whenever possible if sufficient information is available to evaluate the site or if avoidance is an expected mitigation outcome. Recommendations regarding the eligibility of sites will be submitted to the BLM, and a treatment plan will be prepared to detail methods for avoidance of impacts or mitigation of effects. The BLM will make determinations of eligibility and effect and consult with SHPO as necessary based on each proposed lease application and project plans. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated. Avoidance of impacts through project design will be given priority over data recovery as the preferred mitigation measure. Avoidance measures include moving project elements away from site locations or to areas of previous impacts, restricting travel to existing roads, and maintaining barriers and signs in areas of cultural sensitivity. Any data recovery will be preceded by approval of a detailed research design, Native American Consultation, and other requirements for BLM issuance of a permit under the Archaeological Resources Protection Act (BLM 2007a).

If cultural resources are present at the site, or if areas with a high potential to contain cultural material have been identified, a cultural resources management plan (CRMP) will be developed. This plan will address mitigation activities to be taken for cultural resources found at the site. Avoidance of the area is always the preferred mitigation option. Other mitigation options include archaeological survey and excavation (as warranted) and monitoring. If an area exhibits a high potential, but no artifacts were observed during an archaeological survey, monitoring by a qualified archaeologist could be required during all excavation and earthmoving in the high-potential area. A report will be prepared documenting these activities. The CRMP also will (1) establish a monitoring program, (2) identify measures to prevent potential looting/vandalism or erosion impacts, and (3) address the education of workers and the public to make them aware of the consequences of unauthorized collection of artifacts and destruction of property on public land (BLM 2005).

Operators will determine whether paleontological resources exist in a project area on the basis of the sedimentary context of the area, a records search for past paleontological finds in the area, and/or, depending on the extent of existing information, a paleontological survey.

NOTICES (Cont.)

UT-GEO-LN-04: GEOETHICAL ANALYSIS

The operator will perform a detailed geotechnical analysis prior to the construction of any structures; so they will be sited to avoid any hazards from subsidence or liquefaction (i.e., the changing of a saturated soil from a relatively stable solid state to a liquid during earthquakes or nearby blasting).

UT-GEO-LN-05: FOSSILS

This area has low to moderate potential for vertebrate paleontological resources, unless noted to have higher potential in a separate stipulation. This area may contain vertebrate paleontological resources. Inventory and/or on-site monitoring during disturbance or spot checking may be required of the operator. 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. Operations within 250 feet of any such discovery will not be resumed until written authorization to proceed is issued by the Authorized Officer. The lessee will bear the cost of any required paleontological appraisals, surface collection of fossils, or salvage of any large conspicuous fossils of significant scientific interest discovered during the operations.

UT-GEO-LN-06: MIGRATORY BIRDS

The Operator is responsible for compliance with provisions of the Migratory Bird Treaty Act by implementing measures to prevent take of migratory birds. Operators should be aware that any ground clearing or other disturbance (such as creating cross-country access to sites, drilling, and/or construction) during the migratory bird (including raptors) nesting season (March 1 -July 31) risks a violation of the Migratory Bird Treaty Act. Disturbance to nesting migratory birds should be avoided by conducting surface disturbing activities outside the migratory bird nesting season. If surface disturbing activities must be implemented during the nesting season, a preconstruction survey for nesting migratory birds should be performed by a qualified wildlife biologist, during the breeding season (if work is not completed within a specified time frame, then additional surveys may be needed). If active nests are found, an appropriately-sized no surface disturbance buffer determined in coordination with the BLM biologist should be placed on the active nest until the nesting attempt has been completed. If no active nests are found, construction activities must occur within the survey validity time frame specified in the conditions of approval.

UT-GEO-LN-09: WATER RESOURCES

In coordination with State regulatory agencies the operator will comply with all State and Federal surface and ground water rules and regulations for all phases of geothermal exploration, development, and reclamation.

Operators will develop a storm water management plan for the site to ensure compliance with applicable regulations and prevent off- site migration of contaminated storm water or increased soil erosion.

NOTICES (Cont.)

UT-GEO-LN-09: WATER RESOURCES (Cont.)

Operators will gain a clear understanding of the local hydrogeology. Areas of groundwater discharge and recharge and their potential relationships with surface water bodies will be identified.

Operators will avoid creating hydrologic conduits between discrete aquifers during foundation excavation and other activities.

Freshwater-bearing and other usable water aquifers will be protected from contamination by assuring all well casing (excluding the liner) is required to be cemented from the casing shoe to the surface.

Periodic testing and monitoring via observation wells will be conducted in a manner to assure maximum protection of water resources from geothermal fluids or alterations in reservoir pressure.

UT-LN-13: PRONGHORN WINTER HABITAT

The lessee/operator is given notice that lands in this lease have been identified as containing crucial pronghorn winter habitat. Surface use or otherwise disruptive activity may be restricted for up to 60 days during pronghorn fawning season, as determined by BLM, including exploration, drilling and other development activities. Modifications may be required in the Surface Use Plan of Operations including seasonal timing restrictions to protect the species and its habitat.

UT-LN-44: RAPTORS

Appropriate seasonal and spatial buffers shall be placed on all known raptor nests in accordance with Utah Field Office Guidelines for Raptor Protection from Human and Land use Disturbances (USFWS 2002) and Best Management Practices for Raptors and their Associated Habitats in Utah (BLM 2006). All construction related activities will not occur within these buffers if pre-construction monitoring indicates the nests are active, unless a site-specific evaluation for active nests is completed prior to construction and if a BLM wildlife biologist, in consultation with USFWS and UDWR, recommends that activities may be permitted within the buffer. The BLM will coordinate with the USFWS and UDWR and have a recommendation within 3-5 days of notification. Any construction activities authorized within a protective (spatial and seasonal) buffer for raptors will require an on-site monitor. Any indication that activities are adversely affecting the raptor and/or its' young the on-site monitor will suspend activities and contact the BLM Authorized Officer immediately. Construction may occur within the buffers of inactive nests. Construction activities may commence once monitoring of the active nest site determines that fledglings have left the nest and are no longer dependent on the nest site. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

NOTICES (Cont.)

UT-LN-45: MIGRATORY BIRD

The lessee/operator is given notice that surveys for nesting migratory birds may be required during migratory bird breeding season whenever surface disturbances and/or occupancy is proposed in association with fluid mineral exploration and development within priority habitats. Surveys should focus on identified priority bird species in Utah. Field surveys will be conducted as determined by the authorized officer of the Bureau of Land Management. Based on the result of the field survey, the authorized officer will determine appropriate buffers and timing limitations.

UT-LN-46: PYGMY RABBIT

The lessee/operator is given notice that this lease has been identified as containing pygmy rabbit habitat. No surface use or otherwise disruptive activity allowed which would result in an aboveground facility or semi-permanent (e.g., roads, pipelines, reservoirs, etc.) within 300 feet of pygmy rabbit habitat. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

UT-LN-49: UTAH SENSITIVE SPECIES

The lessee/operator is given notice that no surface use or otherwise disruptive activity would be allowed that would result in direct disturbance to populations or individual special status plant and animal species, including those listed on the BLM sensitive species list and the Utah sensitive species list. The lessee/operator is also given notice that lands in this parcel have been identified as containing potential habitat for species on the Utah Sensitive Species List. Modifications to the Surface Use Plan of Operations may be required in order to protect these resources from surface disturbing activities in accordance with Section 6 of the lease terms, Endangered Species Act, Migratory Bird Treaty Act and 43 CFR 3101.1-2.

UT-LN-51: SPECIAL STATUS PLANTS: NOT FEDERALLY LISTED

The lessee/operator is given notice that lands in this lease have been identified as containing special status plants, not federally listed, and their habitats. Modifications to the Surface Use Plan of Operations may be required in order to protect the special status plants and/or habitat from surface disturbing activities in accordance with Section 6 of the lease terms, Endangered Species Act, and 43CFR3101.1-2.

UT-LN-52: NOXIOUS WEEDS

The lessee/operator is given notice that lands in this lease have been identified as containing or is near areas containing noxious weeds. Best management practices to prevent or control noxious weeds may be required for operations on the lease.

NOTICES (Cont.)

UT-LN-53: RIPARIAN AREAS

The lessee/operator is given notice that this lease has been identified as containing riparian areas. No surface use or otherwise disruptive activity allowed within 100 meters of riparian areas unless it can be shown that (1) there is no practicable alternative; (2) that all long-term impacts are fully mitigated; or (3) that the construction is an enhancement to the riparian areas. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

UT-LN-55: WATER AND WATERSHED PROTECTION

The lessee/operator is given notice that this lease may need modifications to the Surface Use Plan of Operations in order to prevent water pollution and protect municipal and non-municipal watershed areas. No surface use or otherwise disruptive activity allowed within 500 feet of live water or the reservoirs located in the Beaver, Milford and Sevier River drainages, Parowan and Cedar Valley drainages, or Pinto Creek/Newcastle Reservoir drainage in order to prevent water quality degradation in accordance with section 6 of the lease terms and 43CFR3101.1-2.

UT-LN-96: AIR QUALITY MITIGATION MEASURES

The lessee is given notice that the Bureau of Land Management (BLM) in coordination with the U.S. Environmental Protection Agency and the Utah Department of Air Quality, among others, has developed the following air quality mitigation measures that may be applied to any development proposed on this lease. Integration of and adherence to these measures may help minimize adverse local or regional air quality impacts from oil and gas development (including but not limited to construction, drilling, and production) on regional ozone formation.

- All internal combustion equipment would be kept in good working order.
- Water or other approved dust suppressants would be used at construction sites and along roads, as determined appropriate by the Authorized Officer.
- Open burning of garbage or refuse would not occur at well sites or other facilities.
- Drill rigs would be equipped with Tier II or better diesel engines.
- Vent emissions from stock tanks and natural gas TEG dehydrators would be controlled by routing the emissions to a flare or similar control device which would reduce emissions by 95% or greater.
- Low bleed or no bleed pneumatics would be installed on separator dump valves and other controllers.
- During completion, flaring would be limited as much as possible. Production equipment and gathering lines would be installed as soon as possible.
- Well site telemetry would be utilized as feasible for production operations.
- Stationary internal combustion engine would comply with the following standards: 2g NOx/bhp-hr for engines <300HP; and 1g NOx/bhp-hr for engines >300HP.

NOTICES (Cont.)

UT-LN-96: AIR QUALITY MITIGATION MEASURES (Cont.)

Additional site-specific measures may also be employed to avoid or minimize effects to local or regional air quality. These additional measures will be developed and implemented in coordination with the U.S. Environmental Protection Agency, the Utah Department of Air Quality, and other agencies with expertise or jurisdiction as appropriate based on the size of the project and magnitude of emissions.

UT-LN-99: REGIONAL OZONE FORMATION CONTROLS

To mitigate any potential impact oil and gas development emissions may have on regional ozone formation, the following Best Management Practices (BMPs) would be required for any development projects:

- Tier II or better drilling rig engines
- Stationary internal combustion engine standard of 2g NOx/bhp-hr for engines <300HP and 1g NOx/bhp-hr for engines >300HP
- Low bleed or no bleed pneumatic pump valves
- Dehydrator VOC emission controls to +95% efficiency
- Tank VOC emission controls to +95% efficiency

UT-LN-101: AIR QUALITY

All new and replacement internal combustion gas field engines of less than or equal to 300 design-rated horsepower must not emit more than 2 grams of NOx per horsepower-hour. This requirement does not apply to gas field engines of less than or equal to 40 design-rated horsepower. AND All new and replacement internal combustion gas field engines of greater than 300 design rated horsepower must not emit more than 1.0 grams of NOx per horsepower-hour. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

UT-LN-102: AIR QUALITY ANALYSIS

The lessee/operator is given notice that prior to project-specific approval, additional air quality analyses may be required to comply with the National Environmental Policy Act, Federal Land Policy Management Act, and/or other applicable laws and regulations. Analyses may include dispersion modeling and/or photochemical modeling for deposition and visibility impacts analysis, control equipment determinations, and/or emission inventory development. These analyses may result in the imposition of additional project-specific air quality control measures.

UT-LN-147: KIT FOX HABITAT

The lessee/operator is given notice that no surface disturbances would be allowed within 660 feet (200 meters) of an occupied natal kit fox den.

NOTICES (Cont.)

UT-LN-156: POLLINATORS AND POLLINATOR HABITAT

In order to protect pollinators and pollinator habitat, in accordance with BLM policy outlined in Instruction Memorandum No. 2016-013, Managing for Pollinators on Public Lands, and Pollinator-Friendly Best Management Practices for Federal Lands (2015), the following avoidance, minimization, and mitigation measures would apply to this parcel:

1. Give a preference for placing well pads in previously disturbed areas, dry areas that do not support forbs, or areas dominated by nonnative grasses.
2. Utilize existing well pads where feasible.
3. Avoid disturbance to native milkweed patches within Monarch migration routes to protect Monarch butterfly habitat.
4. Avoid disturbance of riparian and meadow sites, as well as small depressed areas that may function as water catchments and host nectar-producing species, to protect Monarch butterfly habitat and nectaring sites.
5. Minimize the use of pesticides that negatively impact pollinators.
6. During revegetation treatments:
    a. Include pollinator-friendly site-appropriate native plant seeds or seedlings in seed mixes.
    b. Where possible, increase the cover and diversity of essential habitat components for native pollinators by:
    a. Use minimum till drills where feasible.
        - Using site-appropriate milkweed seeds or seedlings within Monarch migration routes through priority sage-grouse habitat.
        - Using seed mixes with annual and short-lived perennial native forbs that will bloom the first year and provide forage for pollinators.
        - Using seed mixes with a variety of native forb species to ensure different colored and shaped flowers to provide nectar and pollen throughout the growing season for a variety of pollinators.
        - Seeding forbs in separate rows from grasses to avoid competition during establishment.
        - Avoiding seeding non-native forbs and grasses that establish early and out compete slower-growing natives.

SURFACE MANAGEMENT AGENCY

(X) Cedar City Field Office, Bureau of Land Management
176 East D. L. Sargent Drive, Cedar City, Utah 84720

( ) Fillmore Field Office, Bureau of Land Management
35 East 500 North, Fillmore, Utah 84631

( ) Kanab Field Office, Bureau of Land Management
190 E. Center, Kanab, Utah 84741

( ) Moab Field Office, Bureau of Land Management
82 East Dogwood, Suite M, Moab, Utah 84532

( ) Monticello Field Office, Bureau of Land Management
435 North Main Street, Monticello, Utah 84535

( ) Price Field Office, Bureau of Land Management
125 South 600 West, Price, Utah 84501

( ) Richfield Field Office, Bureau of Land Management
150 East 900 North, Richfield, Utah 84701

( ) Salt Lake Field Office, Bureau of Land Management
2370 South 2300 West, Salt Lake City, Utah 84119

( ) St. George Field Office, Bureau of Land Management
345 East Riverside Drive, St. George, Utah 84790

( ) Vernal Field Office, Bureau of Land Management
170 South 500 East, Vernal, Utah 84078

( ) Forest Supervisor, Ashley National Forest
355 North Vernal Avenue, Vernal, Utah 84078

( ) Forest Supervisor, Dixie National Forest,
1789 North Wedgewood Lane, Cedar City, Utah 84720

( ) Forest Supervisor, Fishlake National Forest,
115 East 900 North, Richfield, Utah 84701

( ) Forest Supervisor, Manti-La Sal National Forest
599 West Price River Drive, Price, Utah 84501

( ) Forest Supervisor, Uinta-Wasatch-Cache National Forest
857 W. South Jordan Pkwy, South Jordan, Utah 84095-8594

( ) Regional Director, Bureau of Reclamation
Boulder City, Nevada 89005

( ) Provo Project Office, Bureau of Reclamation
302 East 1860 South, Provo, Utah 84606-7317

( ) Superintendent, Glen Canyon Recreation Area
National Park Service, P. O. Box 1507, Page, Arizona, 86040

STIPULATIONS

HQ-ESA: THREATENED AND ENDANGERED SPECIES ACT

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

HQ-CRP: CULTURAL RESOURCE PROTECTION

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

UT-GEO-S-01: NO SURFACE OCCUPANCY – NATIONAL REGISTER OF HISTORIC PLACES, CULTURAL RESOURCES (SITES, STRUCTURES, OBJECTS, AND TRADITIONAL USE AREAS)

In accordance with the No Surface Occupancy Lease Stipulations in Section 2.3.2 of the December 2008 Bureau of Land Management Record of Decision for the Geothermal Leasing Environmental Impact Statement and the suggested mitigating measures, No Surface Occupancy within the boundary of properties designated or eligible for the National Register of Historic Places, including National Landmarks and National Register Districts and Sites, and additional lands outside the designated boundaries to the extent necessary to protect values where the setting and integrity is critical to their designation or eligibility.

Exception: The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource and/or the resource the resource is no longer National Register quality. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated negative impacts. An exception may be granted for actions designed to enhance the long-term utility or availability of the cultural resources.

Modification: The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

STIPULATIONS (Cont.)

UT-GEO-S-01: NO SURFACE OCCUPANCY – NATIONAL REGISTER OF HISTORIC PLACES, CULTURAL RESOURCES (SITES, STRUCTURES, OBJECTS, AND TRADITIONAL USE AREAS) (Cont.)

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource, or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

UT-GEO-S-02: NO SURFACE OCCUPANCY – TRADITIONAL CULTURAL PROPERTIES

In accordance with the No Surface Occupancy Lease Stipulations in Section 2.3.2 of the December 2008 Bureau of Land Management Record of Decision for the Geothermal Leasing Environmental Impact Statement and the suggested mitigating measures, No Surface Occupancy within areas with important cultural and archaeological resources, such as traditional cultural properties and Native American sacred sites, as identified through consultation.

Exception: None.

Modification: The Authorized Officer may modify the size and shape of the restricted area if through consultation and cultural analysis indicates the traditional cultural properties resource differs or changes.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource, or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

UT-GEO-S-03: NO SURFACE OCCUPANCY – RIPIARIAN HABITAT

No Surface Occupancy (NSO) on and within riparian-wetland vegetated areas to protect the values and functions of these areas. To protect the values and functions of riparian and wetland areas based on the nature, extent, and value of the area potentially affected.

Exception: The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated negative impacts. An exception may be granted for actions designed to enhance the long-term utility or availability of the riparian habitat.

Modification: The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource, or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

STIPULATIONS (Cont.)

UT-GEO-S-04: CONTROLLED SURFACE USE – RIPIARIAN HABITAT BUFFER

Controlled Surface Use (CSU) will be applied within 500 feet of riparian-wetland vegetation to protect the values and functions of these areas. An engineering plan or a study may be required by the operator that identifies the extent of the resource or how the resource will be managed or protected. To protect the values and functions of riparian and wetland areas based on the nature, extent, and value of the area potentially affected.

Exception: The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated negative impacts. An exception may be granted for actions designed to enhance the long-term utility or availability of the riparian habitat.

Modification: The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource, or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

UT-GEO-S-08: NO SURFACE OCCUPANCY– WATER BODIES, WETLANDS, AND/OR 100-YEAR FLOODPLAINS

No Surface Occupancy (NSO) on water bodies, wetlands and/or 100-year floodplains.

Exception: The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated negative impacts. An exception may be granted for actions designed to enhance the long-term utility or availability of the water bodies, wetlands, and/or 100-year floodplains resource.

Modification: The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource, or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

STIPULATIONS (Cont.)

UT-S-239: TIMING LIMITATION – SEASONAL MULE DEER HABITAT

In order to protect important seasonal mule deer habitat, exploration, drilling, and other development activity will be allowed only during the period from May 1 through December 30. This limitation does not apply to maintenance and operation of producing wells.

Exception: Exceptions to this limitation in any year may be specifically approved in writing by the authorized officer of the BLM.

Modification: None
Waiver: None

UT-S-240: TIMING LIMITATION – CRUCIAL DEER WINTER RANGE

In order to protect the crucial Deer Winter Range, exploration, drilling, and other development activity will be allowed during the period from May 1 through December 30. This imitation does not apply to maintenance and operation of producing wells.

Exception: (Cedar City only) Exceptions to this imitation in any year may be specifically authorized in writing by the authorized officer of the BLM.

Modification: None
Waiver: None

NOTICES

UT-GEO-LN-03: PALEONTOLOGICAL AND CULTURAL RESOURCES

Before any specific permits are issued under leases, treatment of cultural resources will follow the procedures established by the Advisory Council on Historic Preservation for compliance with Section 106 of the National Historic Preservation Act. A pedestrian inventory will be undertaken of all portions that have not been previously surveyed or are identified by BLM as requiring inventory to identify properties that are eligible for the National Register of Historic Places (NRHP). Those sites not already evaluated for NRHP eligibility will be evaluated based on surface remains, subsurface testing, archival, and/or ethnographic sources. Subsurface testing will be kept to a minimum whenever possible if sufficient information is available to evaluate the site or if avoidance is an expected mitigation outcome. Recommendations regarding the eligibility of sites will be submitted to the BLM, and a treatment plan will be prepared to detail methods for avoidance of impacts or mitigation of effects. The BLM will make determinations of eligibility and effect and consult with SHPO as necessary based on each proposed lease application and project plans. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated. Avoidance of impacts through project design will be given priority over data recovery as the preferred mitigation measure. Avoidance measures include moving project elements away from site locations or to areas of previous impacts, restricting travel to existing roads, and maintaining barriers and signs in areas of cultural sensitivity. Any data recovery will be preceded by approval of a detailed research design, Native American Consultation, and other requirements for BLM issuance of a permit under the Archaeological Resources Protection Act (BLM 2007a).

If cultural resources are present at the site, or if areas with a high potential to contain cultural material have been identified, a cultural resources management plan (CRMP) will be developed. This plan will address mitigation activities to be taken for cultural resources found at the site. Avoidance of the area is always the preferred mitigation option. Other mitigation options include archaeological survey and excavation (as warranted) and monitoring. If an area exhibits a high potential, but no artifacts were observed during an archaeological survey, monitoring by a qualified archaeologist could be required during all excavation and earthmoving in the high-potential area. A report will be prepared documenting these activities. The CRMP also will (1) establish a monitoring program, (2) identify measures to prevent potential looting/vandalism or erosion impacts, and (3) address the education of workers and the public to make them aware of the consequences of unauthorized collection of artifacts and destruction of property on public land (BLM 2005).

Operators will determine whether paleontological resources exist in a project area on the basis of the sedimentary context of the area, a records search for past paleontological finds in the area, and/or, depending on the extent of existing information, a paleontological survey.

NOTICES (Cont.)

UT-GEO-LN-04: GEOETHICAL ANALYSIS

The operator will perform a detailed geotechnical analysis prior to the construction of any structures; so they will be sited to avoid any hazards from subsidence or liquefaction (i.e., the changing of a saturated soil from a relatively stable solid state to a liquid during earthquakes or nearby blasting).

UT-GEO-LN-05: FOSSILS

This area has low to moderate potential for vertebrate paleontological resources, unless noted to have higher potential in a separate stipulation. This area may contain vertebrate paleontological resources. Inventory and/or on-site monitoring during disturbance or spot checking may be required of the operator. 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. Operations within 250 feet of any such discovery will not be resumed until written authorization to proceed is issued by the Authorized Officer. The lessee will bear the cost of any required paleontological appraisals, surface collection of fossils, or salvage of any large conspicuous fossils of significant scientific interest discovered during the operations.

UT-GEO-LN-06: MIGRATORY BIRDS

The Operator is responsible for compliance with provisions of the Migratory Bird Treaty Act by implementing measures to prevent take of migratory birds. Operators should be aware that any ground clearing or other disturbance (such as creating cross-country access to sites, drilling, and/or construction) during the migratory bird (including raptors) nesting season (March 1 -July 31) risks a violation of the Migratory Bird Treaty Act. Disturbance to nesting migratory birds should be avoided by conducting surface disturbing activities outside the migratory bird nesting season. If surface disturbing activities must be implemented during the nesting season, a preconstruction survey for nesting migratory birds should be performed by a qualified wildlife biologist, during the breeding season (if work is not completed within a specified time frame, then additional surveys may be needed). If active nests are found, an appropriately-sized no surface disturbance buffer determined in coordination with the BLM biologist should be placed on the active nest until the nesting attempt has been completed. If no active nests are found, construction activities must occur within the survey validity time frame specified in the conditions of approval.

UT-GEO-LN-09: WATER RESOURCES

In coordination with State regulatory agencies the operator will comply with all State and Federal surface and ground water rules and regulations for all phases of geothermal exploration, development, and reclamation.

Operators will develop a storm water management plan for the site to ensure compliance with applicable regulations and prevent off- site migration of contaminated storm water or increased soil erosion.

NOTICES (Cont.)

UT-GEO-LN-09: WATER RESOURCES (Cont.)

Operators will gain a clear understanding of the local hydrogeology. Areas of groundwater discharge and recharge and their potential relationships with surface water bodies will be identified.

Operators will avoid creating hydrologic conduits between discrete aquifers during foundation excavation and other activities.

Freshwater-bearing and other usable water aquifers will be protected from contamination by assuring all well casing (excluding the liner) is required to be cemented from the casing shoe to the surface.

Periodic testing and monitoring via observation wells will be conducted in a manner to assure maximum protection of water resources from geothermal fluids or alterations in reservoir pressure.

UT-LN-13: PRONGHORN WINTER HABITAT

The lessee/operator is given notice that lands in this lease have been identified as containing crucial pronghorn winter habitat. Surface use or otherwise disruptive activity may be restricted for up to 60 days during pronghorn fawning season, as determined by BLM, including exploration, drilling and other development activities. Modifications may be required in the Surface Use Plan of Operations including seasonal timing restrictions to protect the species and its habitat.

UT-LN-20: ROCKY MOUNTAIN/DESERT BIGHORN SHEEP CRUCIAL LAMBING AND RUTTING HABITAT

The Lessee/Operator is given notice that the lands in this parcel contains habitat for bighorn sheep. Modifications to the surface use plan may be required in order to protect habitat from surface disturbing activities. Surface use or otherwise disruptive activity may be restricted for up to 60 days during pronghorn fawning season, as determined by BLM. These modifications may include such measures as timing restrictions to avoid surface use during the crucial lambing and rutting seasons. Measure may also include avoidance of certain areas such as water sources and talus slopes.

UT-LN-44: RAPTORS

Appropriate seasonal and spatial buffers shall be placed on all known raptor nests in accordance with Utah Field Office Guidelines for Raptor Protection from Human and Land use Disturbances (USFWS 2002) and Best Management Practices for Raptors and their Associated Habitats in Utah (BLM 2006). All construction related activities will not occur within these buffers if pre-construction monitoring indicates the nests are active, unless a site-specific evaluation for active nests is completed prior to construction and if a BLM wildlife biologist, in consultation with USFWS and UDWR, recommends that activities may be permitted within the buffer. The BLM will coordinate with the USFWS and UDWR and have a recommendation within 3-5 days of

NOTICES (Cont.)

UT-LN-44: RAPTORS (Cont.)

notification. Any construction activities authorized within a protective (spatial and seasonal) buffer for raptors will require an on-site monitor. Any indication that activities are adversely affecting the raptor and/or its' young the on-site monitor will suspend activities and contact the BLM Authorized Officer immediately. Construction may occur within the buffers of inactive nests. Construction activities may commence once monitoring of the active nest site determines that fledglings have left the nest and are no longer dependent on the nest site. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

UT-LN-45: MIGRATORY BIRD

The lessee/operator is given notice that surveys for nesting migratory birds may be required during migratory bird breeding season whenever surface disturbances and/or occupancy is proposed in association with fluid mineral exploration and development within priority habitats. Surveys should focus on identified priority bird species in Utah. Field surveys will be conducted as determined by the authorized officer of the Bureau of Land Management. Based on the result of the field survey, the authorized officer will determine appropriate buffers and timing limitations.

UT-LN-46: PYGMY RABBIT

The lessee/operator is given notice that this lease has been identified as containing pygmy rabbit habitat. No surface use or otherwise disruptive activity allowed which would result in an aboveground facility or semi-permanent (e.g., roads, pipelines, reservoirs, etc.) within 300 feet of pygmy rabbit habitat. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

UT-LN-49: UTAH SENSITIVE SPECIES

The lessee/operator is given notice that no surface use or otherwise disruptive activity would be allowed that would result in direct disturbance to populations or individual special status plant and animal species, including those listed on the BLM sensitive species list and the Utah sensitive species list. The lessee/operator is also given notice that lands in this parcel have been identified as containing potential habitat for species on the Utah Sensitive Species List. Modifications to the Surface Use Plan of Operations may be required in order to protect these resources from surface disturbing activities in accordance with Section 6 of the lease terms, Endangered Species Act, Migratory Bird Treaty Act and 43 CFR 3101.1-2.

UT-LN-51: SPECIAL STATUS PLANTS: NOT FEDERALLY LISTED

The lessee/operator is given notice that lands in this lease have been identified as containing special status plants, not federally listed, and their habitats. Modifications to the Surface Use Plan of Operations may be required in order to protect the special status plants and/or habitat from surface disturbing activities in accordance with Section 6 of the lease terms, Endangered Species Act, and 43CFR3101.1-2.

NOTICES (Cont.)

UT-LN-52: NOXIOUS WEEDS

The lessee/operator is given notice that lands in this lease have been identified as containing or is near areas containing noxious weeds. Best management practices to prevent or control noxious weeds may be required for operations on the lease.

UT-LN-53: RIPARIAN AREAS

The lessee/operator is given notice that this lease has been identified as containing riparian areas. No surface use or otherwise disruptive activity allowed within 100 meters of riparian areas unless it can be shown that (1) there is no practicable alternative; (2) that all long-term impacts are fully mitigated; or (3) that the construction is an enhancement to the riparian areas. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

UT-LN-55: WATER AND WATERSHED PROTECTION

The lessee/operator is given notice that this lease may need modifications to the Surface Use Plan of Operations in order to prevent water pollution and protect municipal and non-municipal watershed areas. No surface use or otherwise disruptive activity allowed within 500 feet of live water or the reservoirs located in the Beaver, Milford and Sevier River drainages, Parowan and Cedar Valley drainages, or Pinto Creek/Newcastle Reservoir drainage in order to prevent water quality degradation in accordance with section 6 of the lease terms and 43CFR3101.1-2.

UT-LN-96: AIR QUALITY MITIGATION MEASURES

The lessee is given notice that the Bureau of Land Management (BLM) in coordination with the U.S. Environmental Protection Agency and the Utah Department of Air Quality, among others, has developed the following air quality mitigation measures that may be applied to any development proposed on this lease. Integration of and adherence to these measures may help minimize adverse local or regional air quality impacts from oil and gas development (including but not limited to construction, drilling, and production) on regional ozone formation.

- All internal combustion equipment would be kept in good working order.
- Water or other approved dust suppressants would be used at construction sites and along roads, as determined appropriate by the Authorized Officer.
- Open burning of garbage or refuse would not occur at well sites or other facilities.
- Drill rigs would be equipped with Tier II or better diesel engines.
- Vent emissions from stock tanks and natural gas TEG dehydrators would be controlled by routing the emissions to a flare or similar control device which would reduce emissions by 95% or greater.
- Low bleed or no bleed pneumatics would be installed on separator dump valves and other controllers.
- During completion, flaring would be limited as much as possible. Production equipment and gathering lines would be installed as soon as possible.
- Well site telemetry would be utilized as feasible for production operations.
- Stationary internal combustion engine would comply with the following standards: 2g NOx/bhp-hr for engines <300HP; and 1g NOx/bhp-hr for engines >300HP.

NOTICES (Cont.)

UT-LN-96: AIR QUALITY MITIGATION MEASURES (Cont.)

Additional site-specific measures may also be employed to avoid or minimize effects to local or regional air quality. These additional measures will be developed and implemented in coordination with the U.S. Environmental Protection Agency, the Utah Department of Air Quality, and other agencies with expertise or jurisdiction as appropriate based on the size of the project and magnitude of emissions.

UT-LN-99: REGIONAL OZONE FORMATION CONTROLS

To mitigate any potential impact oil and gas development emissions may have on regional ozone formation, the following Best Management Practices (BMPs) would be required for any development projects:

- Tier II or better drilling rig engines
- Stationary internal combustion engine standard of 2g NOx/bhp-hr for engines <300HP and 1g NOx/bhp-hr for engines >300HP
- Low bleed or no bleed pneumatic pump valves
- Dehydrator VOC emission controls to +95% efficiency
- Tank VOC emission controls to +95% efficiency

UT-LN-101: AIR QUALITY

All new and replacement internal combustion gas field engines of less than or equal to 300 design-rated horsepower must not emit more than 2 grams of NOx per horsepower-hour. This requirement does not apply to gas field engines of less than or equal to 40 design-rated horsepower. AND All new and replacement internal combustion gas field engines of greater than 300 design rated horsepower must not emit more than 1.0 grams of NOx per horsepower-hour. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

UT-LN-102: AIR QUALITY ANALYSIS

The lessee/operator is given notice that prior to project-specific approval, additional air quality analyses may be required to comply with the National Environmental Policy Act, Federal Land Policy Management Act, and/or other applicable laws and regulations. Analyses may include dispersion modeling and/or photochemical modeling for deposition and visibility impacts analysis, control equipment determinations, and/or emission inventory development. These analyses may result in the imposition of additional project-specific air quality control measures.

UT-LN-147: KIT FOX HABITAT

The lessee/operator is given notice that no surface disturbances would be allowed within 660 feet (200 meters) of an occupied natal kit fox den.

NOTICES (Cont.)

UT-LN-156: POLLINATORS AND POLLINATOR HABITAT

In order to protect pollinators and pollinator habitat, in accordance with BLM policy outlined in Instruction Memorandum No. 2016-013, Managing for Pollinators on Public Lands, and Pollinator-Friendly Best Management Practices for Federal Lands (2015), the following avoidance, minimization, and mitigation measures would apply to this parcel:

1. Give a preference for placing well pads in previously disturbed areas, dry areas that do not support forbs, or areas dominated by nonnative grasses.
2. Utilize existing well pads where feasible.
3. Avoid disturbance to native milkweed patches within Monarch migration routes to protect Monarch butterfly habitat.
4. Avoid disturbance of riparian and meadow sites, as well as small depressed areas that may function as water catchments and host nectar-producing species, to protect Monarch butterfly habitat and nectaring sites.
5. Minimize the use of pesticides that negatively impact pollinators.
6. During revegetation treatments:
   a. Include pollinator-friendly site-appropriate native plant seeds or seedlings in seed mixes.
   b. Where possible, increase the cover and diversity of essential habitat components for native pollinators by:
   a. Use minimum till drills where feasible.
      - Using site-appropriate milkweed seeds or seedlings within Monarch migration routes through priority sage-grouse habitat.
      - Using seed mixes with annual and short-lived perennial native forbs that will bloom the first year and provide forage for pollinators.
      - Using seed mixes with a variety of native forb species to ensure different colored and shaped flowers to provide nectar and pollen throughout the growing season for a variety of pollinators.
      - Seeding forbs in separate rows from grasses to avoid competition during establishment.
      - Avoiding seeding non-native forbs and grasses that establish early and out compete slower-growing natives.

SURFACE MANAGEMENT AGENCY

(X) Cedar City Field Office, Bureau of Land Management
176 East D. L. Sargent Drive, Cedar City, Utah 84720

( ) Fillmore Field Office, Bureau of Land Management
35 East 500 North, Fillmore, Utah 84631

( ) Kanab Field Office, Bureau of Land Management
190 E. Center, Kanab, Utah 84741

( ) Moab Field Office, Bureau of Land Management
82 East Dogwood, Suite M, Moab, Utah 84532

( ) Monticello Field Office, Bureau of Land Management
435 North Main Street, Monticello, Utah 84535

( ) Price Field Office, Bureau of Land Management
125 South 600 West, Price, Utah 84501

( ) Richfield Field Office, Bureau of Land Management
150 East 900 North, Richfield, Utah 84701

( ) Salt Lake Field Office, Bureau of Land Management
2370 South 2300 West, Salt Lake City, Utah 84119

( ) St. George Field Office, Bureau of Land Management
345 East Riverside Drive, St. George, Utah 84790

( ) Vernal Field Office, Bureau of Land Management
170 South 500 East, Vernal, Utah 84078

( ) Forest Supervisor, Ashley National Forest
355 North Vernal Avenue, Vernal, Utah 84078

( ) Forest Supervisor, Dixie National Forest,
1789 North Wedgewood Lane, Cedar City, Utah 84720

( ) Forest Supervisor, Fishlake National Forest,
115 East 900 North, Richfield, Utah 84701

( ) Forest Supervisor, Manti-La Sal National Forest
599 West Price River Drive, Price, Utah 84501

( ) Forest Supervisor, Uinta-Wasatch-Cache National Forest
857 W. South Jordan Pkwy, South Jordan, Utah 84095-8594

( ) Regional Director, Bureau of Reclamation
Boulder City, Nevada 89005

( ) Provo Project Office, Bureau of Reclamation
302 East 1860 South, Provo, Utah 84606-7317

( ) Superintendent, Glen Canyon Recreation Area
National Park Service, P. O. Box 1507, Page, Arizona, 86040

STIPULATIONS

HQ-ESA: THREATENED AND ENDANGERED SPECIES ACT

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

HQ-CRP: CULTURAL RESOURCE PROTECTION

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

UT-GEO-S-01: NO SURFACE OCCUPANCY – NATIONAL REGISTER OF HISTORIC PLACES, CULTURAL RESOURCES (SITES, STRUCTURES, OBJECTS, AND TRADITIONAL USE AREAS)

In accordance with the No Surface Occupancy Lease Stipulations in Section 2.3.2 of the December 2008 Bureau of Land Management Record of Decision for the Geothermal Leasing Environmental Impact Statement and the suggested mitigating measures, No Surface Occupancy within the boundary of properties designated or eligible for the National Register of Historic Places, including National Landmarks and National Register Districts and Sites, and additional lands outside the designated boundaries to the extent necessary to protect values where the setting and integrity is critical to their designation or eligibility.

Exception: The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource and/or the resource the resource is no longer National Register quality. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated negative impacts. An exception may be granted for actions designed to enhance the long-term utility or availability of the cultural resources.

Modification: The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

STIPULATIONS (Cont.)

UT-GEO-S-01: NO SURFACE OCCUPANCY – NATIONAL REGISTER OF HISTORIC PLACES, CULTURAL RESOURCES (SITES, STRUCTURES, OBJECTS, AND TRADITIONAL USE AREAS) (Cont.)

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource, or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

UT-GEO-S-02: NO SURFACE OCCUPANCY – TRADITIONAL CULTURAL PROPERTIES

In accordance with the No Surface Occupancy Lease Stipulations in Section 2.3.2 of the December 2008 Bureau of Land Management Record of Decision for the Geothermal Leasing Environmental Impact Statement and the suggested mitigating measures, No Surface Occupancy within areas with important cultural and archaeological resources, such as traditional cultural properties and Native American sacred sites, as identified through consultation.

Exception: None.

Modification: The Authorized Officer may modify the size and shape of the restricted area if through consultation and cultural analysis indicates the traditional cultural properties resource differs or changes.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource, or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

NOTICES

UT-GEO-LN-03: PALEONTOLOGICAL AND CULTURAL RESOURCES

Before any specific permits are issued under leases, treatment of cultural resources will follow the procedures established by the Advisory Council on Historic Preservation for compliance with Section 106 of the National Historic Preservation Act. A pedestrian inventory will be undertaken of all portions that have not been previously surveyed or are identified by BLM as requiring inventory to identify properties that are eligible for the National Register of Historic Places (NRHP). Those sites not already evaluated for NRHP eligibility will be evaluated based on surface remains, subsurface testing, archival, and/or ethnographic sources. Subsurface testing will be kept to a minimum whenever possible if sufficient information is available to evaluate the site or if avoidance is an expected mitigation outcome. Recommendations regarding the eligibility of sites will be submitted to the BLM, and a treatment plan will be prepared to detail methods for avoidance of impacts or mitigation of effects. The BLM will make determinations of eligibility and effect and consult with SHPO as necessary based on each proposed lease application and project plans. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated. Avoidance of impacts through project design will be given priority over data recovery as the preferred mitigation measure. Avoidance measures include moving project elements away from site locations or to areas of previous impacts, restricting travel to existing roads, and maintaining barriers and signs in areas of cultural sensitivity. Any data recovery will be preceded by approval of a detailed research design, Native American Consultation, and other requirements for BLM issuance of a permit under the Archaeological Resources Protection Act (BLM 2007a).

If cultural resources are present at the site, or if areas with a high potential to contain cultural material have been identified, a cultural resources management plan (CRMP) will be developed. This plan will address mitigation activities to be taken for cultural resources found at the site. Avoidance of the area is always the preferred mitigation option. Other mitigation options include archaeological survey and excavation (as warranted) and monitoring. If an area exhibits a high potential, but no artifacts were observed during an archaeological survey, monitoring by a qualified archaeologist could be required during all excavation and earthmoving in the high-potential area. A report will be prepared documenting these activities. The CRMP also will (1) establish a monitoring program, (2) identify measures to prevent potential looting/vandalism or erosion impacts, and (3) address the education of workers and the public to make them aware of the consequences of unauthorized collection of artifacts and destruction of property on public land (BLM 2005).

Operators will determine whether paleontological resources exist in a project area on the basis of the sedimentary context of the area, a records search for past paleontological finds in the area, and/or, depending on the extent of existing information, a paleontological survey.

NOTICES (Cont.)

UT-GEO-LN-04: GEOETHICAL ANALYSIS

The operator will perform a detailed geotechnical analysis prior to the construction of any structures; so they will be sited to avoid any hazards from subsidence or liquefaction (i.e., the changing of a saturated soil from a relatively stable solid state to a liquid during earthquakes or nearby blasting).

UT-GEO-LN-05: FOSSILS

This area has low to moderate potential for vertebrate paleontological resources, unless noted to have higher potential in a separate stipulation. This area may contain vertebrate paleontological resources. Inventory and/or on-site monitoring during disturbance or spot checking may be required of the operator. 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. Operations within 250 feet of any such discovery will not be resumed until written authorization to proceed is issued by the Authorized Officer. The lessee will bear the cost of any required paleontological appraisals, surface collection of fossils, or salvage of any large conspicuous fossils of significant scientific interest discovered during the operations.

UT-GEO-LN-06: MIGRATORY BIRDS

The Operator is responsible for compliance with provisions of the Migratory Bird Treaty Act by implementing measures to prevent take of migratory birds. Operators should be aware that any ground clearing or other disturbance (such as creating cross-country access to sites, drilling, and/or construction) during the migratory bird (including raptors) nesting season (March 1 -July 31) risks a violation of the Migratory Bird Treaty Act. Disturbance to nesting migratory birds should be avoided by conducting surface disturbing activities outside the migratory bird nesting season. If surface disturbing activities must be implemented during the nesting season, a preconstruction survey for nesting migratory birds should be performed by a qualified wildlife biologist, during the breeding season (if work is not completed within a specified time frame, then additional surveys may be needed). If active nests are found, an appropriately-sized no surface disturbance buffer determined in coordination with the BLM biologist should be placed on the active nest until the nesting attempt has been completed. If no active nests are found, construction activities must occur within the survey validity time frame specified in the conditions of approval.

UT-GEO-LN-09: WATER RESOURCES

In coordination with State regulatory agencies the operator will comply with all State and Federal surface and ground water rules and regulations for all phases of geothermal exploration, development, and reclamation.

Operators will develop a storm water management plan for the site to ensure compliance with applicable regulations and prevent off- site migration of contaminated storm water or increased soil erosion.

NOTICES (Cont.)

UT-GEO-LN-09: WATER RESOURCES (Cont.)

Operators will gain a clear understanding of the local hydrogeology. Areas of groundwater discharge and recharge and their potential relationships with surface water bodies will be identified.

Operators will avoid creating hydrologic conduits between discrete aquifers during foundation excavation and other activities.

Freshwater-bearing and other usable water aquifers will be protected from contamination by assuring all well casing (excluding the liner) is required to be cemented from the casing shoe to the surface.

Periodic testing and monitoring via observation wells will be conducted in a manner to assure maximum protection of water resources from geothermal fluids or alterations in reservoir pressure.

UT-LN-13: PRONGHORN WINTER HABITAT

The lessee/operator is given notice that lands in this lease have been identified as containing crucial pronghorn winter habitat. Surface use or otherwise disruptive activity may be restricted for up to 60 days during pronghorn fawning season, as determined by BLM, including exploration, drilling and other development activities. Modifications may be required in the Surface Use Plan of Operations including seasonal timing restrictions to protect the species and its habitat.

UT-LN-44: RAPTORS

Appropriate seasonal and spatial buffers shall be placed on all known raptor nests in accordance with Utah Field Office Guidelines for Raptor Protection from Human and Land use Disturbances (USFWS 2002) and Best Management Practices for Raptors and their Associated Habitats in Utah (BLM 2006). All construction related activities will not occur within these buffers if pre-construction monitoring indicates the nests are active, unless a site-specific evaluation for active nests is completed prior to construction and if a BLM wildlife biologist, in consultation with USFWS and UDWR, recommends that activities may be permitted within the buffer. The BLM will coordinate with the USFWS and UDWR and have a recommendation within 3-5 days of notification. Any construction activities authorized within a protective (spatial and seasonal) buffer for raptors will require an on-site monitor. Any indication that activities are adversely affecting the raptor and/or its' young the on-site monitor will suspend activities and contact the BLM Authorized Officer immediately. Construction may occur within the buffers of inactive nests. Construction activities may commence once monitoring of the active nest site determines that fledglings have left the nest and are no longer dependent on the nest site. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

NOTICES (Cont.)

UT-LN-45: MIGRATORY BIRD

The lessee/operator is given notice that surveys for nesting migratory birds may be required during migratory bird breeding season whenever surface disturbances and/or occupancy is proposed in association with fluid mineral exploration and development within priority habitats. Surveys should focus on identified priority bird species in Utah. Field surveys will be conducted as determined by the authorized officer of the Bureau of Land Management. Based on the result of the field survey, the authorized officer will determine appropriate buffers and timing limitations.

UT-LN-46: PYGMY RABBIT

The lessee/operator is given notice that this lease has been identified as containing pygmy rabbit habitat. No surface use or otherwise disruptive activity allowed which would result in an aboveground facility or semi-permanent (e.g., roads, pipelines, reservoirs, etc.) within 300 feet of pygmy rabbit habitat. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

UT-LN-49: UTAH SENSITIVE SPECIES

The lessee/operator is given notice that no surface use or otherwise disruptive activity would be allowed that would result in direct disturbance to populations or individual special status plant and animal species, including those listed on the BLM sensitive species list and the Utah sensitive species list. The lessee/operator is also given notice that lands in this parcel have been identified as containing potential habitat for species on the Utah Sensitive Species List. Modifications to the Surface Use Plan of Operations may be required in order to protect these resources from surface disturbing activities in accordance with Section 6 of the lease terms, Endangered Species Act, Migratory Bird Treaty Act and 43 CFR 3101.1-2.

UT-LN-51: SPECIAL STATUS PLANTS: NOT FEDERALLY LISTED

The lessee/operator is given notice that lands in this lease have been identified as containing special status plants, not federally listed, and their habitats. Modifications to the Surface Use Plan of Operations may be required in order to protect the special status plants and/or habitat from surface disturbing activities in accordance with Section 6 of the lease terms, Endangered Species Act, and 43CFR3101.1-2.

UT-LN-52: NOXIOUS WEEDS

The lessee/operator is given notice that lands in this lease have been identified as containing or is near areas containing noxious weeds. Best management practices to prevent or control noxious weeds may be required for operations on the lease.

NOTICES (Cont.)

UT-LN-71: PALEONTOLOGICAL

The lessee/operator is given notice that this lease has been identified as containing paleontological resources. Surveys will be required whenever surface disturbances and/or occupancy is proposed in association with fluid mineral exploration and development within geological strata that may contain important paleontological resources. Field surveys will be conducted as determined by the authorized officer of the Bureau of Land Management. Exploration, drilling and other development activities may be restricted based on the result of the field survey; the authorized officer will determine appropriate mitigations. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

UT-LN-96: AIR QUALITY MITIGATION MEASURES

The lessee is given notice that the Bureau of Land Management (BLM) in coordination with the U.S. Environmental Protection Agency and the Utah Department of Air Quality, among others, has developed the following air quality mitigation measures that may be applied to any development proposed on this lease. Integration of and adherence to these measures may help minimize adverse local or regional air quality impacts from oil and gas development (including but not limited to construction, drilling, and production) on regional ozone formation.

- All internal combustion equipment would be kept in good working order.
- Water or other approved dust suppressants would be used at construction sites and along roads, as determined appropriate by the Authorized Officer.
- Open burning of garbage or refuse would not occur at well sites or other facilities.
- Drill rigs would be equipped with Tier II or better diesel engines.
- Vent emissions from stock tanks and natural gas TEG dehydrators would be controlled by routing the emissions to a flare or similar control device which would reduce emissions by 95% or greater.
- Low bleed or no bleed pneumatics would be installed on separator dump valves and other controllers.
- During completion, flaring would be limited as much as possible. Production equipment and gathering lines would be installed as soon as possible.
- Well site telemetry would be utilized as feasible for production operations.
- Stationary internal combustion engine would comply with the following standards: 2g NOx/bhp-hr for engines <300HP; and 1g NOx/bhp-hr for engines >300HP.

Additional site-specific measures may also be employed to avoid or minimize effects to local or regional air quality. These additional measures will be developed and implemented in coordination with the U.S. Environmental Protection Agency, the Utah Department of Air Quality, and other agencies with expertise or jurisdiction as appropriate based on the size of the project and magnitude of emissions.

NOTICES (Cont.)

UT-LN-99: REGIONAL OZONE FORMATION CONTROLS

To mitigate any potential impact oil and gas development emissions may have on regional ozone formation, the following Best Management Practices (BMPs) would be required for any development projects:

- Tier II or better drilling rig engines
- Stationary internal combustion engine standard of 2g NOx/bhp-hr for engines <300HP and 1g NOx/bhp-hr for engines >300HP
- Low bleed or no bleed pneumatic pump valves
- Dehydrator VOC emission controls to +95% efficiency
- Tank VOC emission controls to +95% efficiency

UT-LN-101: AIR QUALITY

All new and replacement internal combustion gas field engines of less than or equal to 300 design-rated horsepower must not emit more than 2 grams of NOx per horsepower-hour. This requirement does not apply to gas field engines of less than or equal to 40 design-rated horsepower. AND All new and replacement internal combustion gas field engines of greater than 300 design rated horsepower must not emit more than 1.0 grams of NOx per horsepower-hour. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

UT-LN-102: AIR QUALITY ANALYSIS

The lessee/operator is given notice that prior to project-specific approval, additional air quality analyses may be required to comply with the National Environmental Policy Act, Federal Land Policy Management Act, and/or other applicable laws and regulations. Analyses may include dispersion modeling and/or photochemical modeling for deposition and visibility impacts analysis, control equipment determinations, and/or emission inventory development. These analyses may result in the imposition of additional project-specific air quality control measures.

UT-LN-147: KIT FOX HABITAT

The lessee/operator is given notice that no surface disturbances would be allowed within 660 feet (200 meters) of an occupied natal kit fox den.

UT-LN-156: POLLINATORS AND POLLINATOR HABITAT

In order to protect pollinators and pollinator habitat, in accordance with BLM policy outlined in Instruction Memorandum No. 2016-013, Managing for Pollinators on Public Lands, and Pollinator-Friendly Best Management Practices for Federal Lands (2015), the following avoidance, minimization, and mitigation measures would apply to this parcel:

1. Give a preference for placing well pads in previously disturbed areas, dry areas that do not support forbs, or areas dominated by nonnative grasses.
2. Utilize existing well pads where feasible.
3. Avoid disturbance to native milkweed patches within Monarch migration routes to protect Monarch butterfly habitat.

NOTICES (Cont.)

UT-LN-156: POLLINATORS AND POLLINATOR HABITAT (Cont.)

4. Avoid disturbance of riparian and meadow sites, as well as small depressed areas that may function as water catchments and host nectar-producing species, to protect Monarch butterfly habitat and nectaring sites.
5. Minimize the use of pesticides that negatively impact pollinators.
6. During revegetation treatments:
   a. Include pollinator-friendly site-appropriate native plant seeds or seedlings in seed mixes.
   b. Where possible, increase the cover and diversity of essential habitat components for native pollinators by:
   a. Use minimum till drills where feasible.
      - Using site-appropriate milkweed seeds or seedlings within Monarch migration routes through priority sage-grouse habitat.
      - Using seed mixes with annual and short-lived perennial native forbs that will bloom the first year and provide forage for pollinators.
      - Using seed mixes with a variety of native forb species to ensure different colored and shaped flowers to provide nectar and pollen throughout the growing season for a variety of pollinators.
      - Seeding forbs in separate rows from grasses to avoid competition during establishment.
      - Avoiding seeding non-native forbs and grasses that establish early and out compete slower-growing natives.

SURFACE MANAGEMENT AGENCY

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( ) Fillmore Field Office, Bureau of Land Management
35 East 500 North, Fillmore, Utah 84631

( ) Kanab Field Office, Bureau of Land Management
190 E. Center, Kanab, Utah 84741

( ) Moab Field Office, Bureau of Land Management
82 East Dogwood, Suite M, Moab, Utah 84532

( ) Monticello Field Office, Bureau of Land Management
435 North Main Street, Monticello, Utah 84535

( ) Price Field Office, Bureau of Land Management
125 South 600 West, Price, Utah 84501

( ) Richfield Field Office, Bureau of Land Management
150 East 900 North, Richfield, Utah 84701

( ) Salt Lake Field Office, Bureau of Land Management
2370 South 2300 West, Salt Lake City, Utah 84119

( ) St. George Field Office, Bureau of Land Management
345 East Riverside Drive, St. George, Utah 84790

( ) Vernal Field Office, Bureau of Land Management
170 South 500 East, Vernal, Utah 84078

( ) Forest Supervisor, Ashley National Forest
355 North Vernal Avenue, Vernal, Utah 84078

( ) Forest Supervisor, Dixie National Forest,
1789 North Wedgewood Lane, Cedar City, Utah 84720

( ) Forest Supervisor, Fishlake National Forest,
115 East 900 North, Richfield, Utah 84701

( ) Forest Supervisor, Manti-La Sal National Forest
599 West Price River Drive, Price, Utah 84501

( ) Forest Supervisor, Uinta-Wasatch-Cache National Forest
857 W. South Jordan Pkwy, South Jordan, Utah 84095-8594

( ) Regional Director, Bureau of Reclamation
Boulder City, Nevada 89005

( ) Provo Project Office, Bureau of Reclamation
302 East 1860 South, Provo, Utah 84606-7317

( ) Superintendent, Glen Canyon Recreation Area
National Park Service, P. O. Box 1507, Page, Arizona, 86040

CULTURAL RESOURCE PROTECTION

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

On the lands described below:

All Lands

THREATENED AND ENDANGERED SPECIES ACT

Stipulation: The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. The BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that would contribute to a need to list such a species or their habitat. The 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. The BLM will not approve any ground-disturbing activity until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. § 1531 et seq. including completion of any required procedure for conference or consultation.

On the lands described below:

All Lands

CSU - RIPARIAN HABITAT BUFFER (2008 ROD 2.3.3. CSU STIPS)

Stipulation: Controlled Surface Use (CSU) will be applied within 500 feet of riparian-wetland vegetation to protect the values and functions of these areas. An engineering plan or a study may be required by the operator that identifies the extent of the resource or how the resource will be managed or protected. To protect the values and functions of riparian and wetland areas based on the nature, extent, and value of the area potentially affected.

Exception: The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated negative impacts. An exception may be granted for actions designed to enhance the long-term utility or availability of the riparian habitat.

Modification: The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

On the lands described below:

All Lands

CSU - SOIL SEVERE EROSION (2008 ROD 2.3.3. CSU STIPS)

Stipulation: Controlled Surface Use (CSU) on lands with a severe soil wind or water erosion hazard rating (as designed by NRCS soil survey data when available). Prior to surface disturbance on soils with a severe erosion hazard rating, a site-specific construction, stabilization, and reclamation plan (Plan) must be submitted to the BLM by the applicant as a component of the Geothermal Drilling/Application for Permit to Drill – Plan of Operations. The operator may not initiate surface disturbing activities unless the Authorized Officer has approved the Plan or approved it with conditions.

The plan must demonstrate to the Authorized Officer's satisfaction how the operator will meet the following performance standards:

- Soil stability is maintained preventing slope failure and wind or water erosion.
- The site will be stable with no evidence of accelerated erosion features.
- The rate of soil erosion will be controlled to maintain or improve soil quality and sustainability. The disturbed soils shall have characteristics that approximate the reference site with regard to quantitative and qualitative soil erosion indicators described in H-7100-1 Soil Inventory, Monitoring, and Management Handbook.
- Sufficient topsoil is maintained for ensuring successful final reclamation. Interim reclamation will be completed, by re-spreading the topsoil over the areas being reclaimed.
- The original landform and site productivity will be partially restored during interim reclamation and fully restored as a result of final reclamation.

To maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep slopes, to avoid areas subject to slope failure, mass wasting, piping, or having excessive reclamation problems, and ensure successful interim and final reclamation.

Exception: The Authorized Officer may grant an exception if a staff review determines that the proposed action is of a scale (pipeline, vs. road, vs. well pad) or sited in a location, or a soil survey determines that the soil properties do not meet the severe erosion hazard criteria so that the proposed action would not result in a failure to meet the performance standards above.

Modification: The Authorized Officer may modify the size and shape of the restricted area subject to the stipulation based upon a NRCS soil survey or BLM evaluation. The stipulation and performance standards identified above may also be modified based on negative or positive monitoring results from similar proposed actions on similar sites or increased national or state performance standards. The authorized officer may modify the size and shape of the restricted area subject to the stipulation based upon a NRCS soil survey or BLM

evaluation. The stipulation and performance standards identified above may also be modified based on negative or positive monitoring results from similar proposed actions on similar sites or increased national or state performance standards.

Waiver: The restriction may be waived if it is determined that the described lands do no do not include soils with severe erosion hazard. This determination shall be based upon NRCS mapping and BLM evaluation of the area.

On the lands described below:

All Lands

CSU - CRITICAL WATERSHED - PERENNIAL STREAMS AND SPRINGS

Stipulation: In order to protect Critical Watershed, no occupancy or other subsurface disturbance will be allowed within 500 feet of any perennial streams and springs. This stipulation does not apply to maintenance and operation of producing wells.
Exception: Exceptions to this stipulation in any year may be specifically writing by the authorized officer of the BLM if it can be shown that the activity would not impact the watershed.
Modification: None
Waiver: None

On the lands described below:

All Lands

LEASE NOTICE

Monitoring (2008 ROD BMPs)

Prior to geothermal exploration and development, a complete subsurface geotechnical investigation will be conducted to analyze the soil and geologic conditions. The investigation will evaluate and identify potential geologic hazards and would provide remedial grading recommendations, foundation and slab design criteria, and soil parameters for the design of geothermal power infrastructure.

The operator will collect available information describing the environmental and socio-cultural conditions in the vicinity of the proposed project and will provide the information to the agency.

A monitoring program will be developed by the operator to ensure that environmental conditions are monitored during the exploration and well drilling, testing, construction, and utilization and reclamation phases. The monitoring program requirements, including adaptive management strategies, will be established at the project level to ensure that potential adverse impacts of geothermal development are mitigated. The monitoring program will identify the monitoring requirements for each major environmental resource present at the site, establish metrics against which monitoring observations can be measured, identify potential mitigation measures, and establish protocols for incorporating monitoring observations and additional mitigation measures into ongoing activities. The operator will provide results of the monitoring program to the agency in an annual report.

The operator will comply with the Secretary of Agriculture's rules and regulations for all use and occupancy of the NFS lands prior to approval of an exploration plan by the Secretary of Interior and for uses of all existing improvements, such as forest development roads, within and outside the area permitted by the Secretary of Interior; and use and occupancy of the NFS lands not authorized by an exploration plan approved by the Secretary of Interior.

LEASE NOTICE

Paleontological and Cultural Resources (2008 ROD BMPs)

Before any specific permits are issued under leases, treatment of cultural resources will follow the procedures established by the Advisory Council on Historic Preservation for compliance with Section 106 of the National Historic Preservation Act. A pedestrian inventory will be undertaken of all portions that have not been previously surveyed or are identified by BLM as requiring inventory to identify properties that are eligible for the National Register of Historic Places (NRHP). Those sites not already evaluated for NRHP eligibility will be evaluated based on surface remains, subsurface testing, archival, and/or ethnographic sources. Subsurface testing will be kept to a minimum whenever possible if sufficient information is available to evaluate the site or if avoidance is an expected mitigation outcome. Recommendations regarding the eligibility of sites will be submitted to the BLM, and a treatment plan will be prepared to detail methods for avoidance of impacts or mitigation of effects. The BLM will make determinations of eligibility and effect and consult with SHPO as necessary based on each proposed lease application and project plans. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated. Avoidance of impacts through project design will be given priority over data recovery as the preferred mitigation measure. Avoidance measures include moving project elements away from site locations or to areas of previous impacts, restricting travel to existing roads, and maintaining barriers and signs in areas of cultural sensitivity. Any data recovery will be preceded by approval of a detailed research design, Native American Consultation, and other requirements for BLM issuance of a permit under the Archaeological Resources Protection Act (BLM 2007a).

If cultural resources are present at the site, or if areas with a high potential to contain cultural material have been identified, a cultural resources management plan (CRMP) will be developed. This plan will address mitigation activities to be taken for cultural resources found at the site. Avoidance of the area is always the preferred mitigation option. Other mitigation options include archaeological survey and excavation (as warranted) and monitoring. If an area exhibits a high potential, but no artifacts were observed during an archaeological survey, monitoring by a qualified archaeologist could be required during all excavation and earthmoving in the high- potential area. A report will be prepared documenting these activities. The CRMP also will (1) establish a monitoring program, (2) identify measures to prevent potential looting/vandalism or erosion impacts, and (3) address the education of workers and the public to make them aware of the consequences of unauthorized collection of artifacts and destruction of property on public land (BLM 2005).

Operators will determine whether paleontological resources exist in a project area on the basis of the sedimentary context of the area, a records search for past paleontological finds in the area, and/or, depending on the extent of existing information, a paleontological survey.

If paleontological resources are present at the site, or if areas with a high potential to contain paleontological material have been identified, a paleontological resources management plan will be developed. This plan will include a mitigation plan for avoidance, removal of fossils, or monitoring. If an area exhibits a high potential but no fossils were observed during survey, monitoring by a qualified paleontologist may be required during excavation and earthmoving in the sensitive area. The operator will submit a report to the agency documenting these activities. The paleontological resources management plan also will (1) establish a monitoring program, (2) identify measures to prevent potential looting/vandalism or erosion impacts, and (3) address the education of workers and the public to make them aware of the consequences of unauthorized collection of fossils on public land.

UTUT105294998

LEASE NOTICE

Geotechnical Analysis (2008 ROD)

The operator will perform a detailed geotechnical analysis prior to the construction of any structures; so, they will be sited to avoid any hazards from subsidence or liquefaction (i.e., the changing of a saturated soil from a relatively stable solid state to a liquid during earthquakes or nearby blasting).

LEASE NOTICE

Fossils

This area has low to moderate potential for vertebrate paleontological resources, unless noted to have higher potential in a separate stipulation. This area may contain vertebrate paleontological resources. Inventory and/or on-site monitoring during disturbance or spot checking may be required of the operator. 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. Operations within 250 feet of any such discovery will not be resumed until written authorization to proceed is issued by the Authorized Officer. The lessee will bear the cost of any required paleontological appraisals, surface collection of fossils, or salvage of any large conspicuous fossils of significant scientific interest discovered during the operations.

LEASE NOTICE

Migratory Birds

The Operator is responsible for compliance with provisions of the Migratory Bird Treaty Act by implementing measures to prevent take of migratory birds. Operators should be aware that any ground clearing or other disturbance (such as creating cross-country access to sites, drilling, and/or construction) during the migratory bird (including raptors) nesting season (March 1 -July 31) risks a violation of the Migratory Bird Treaty Act. Disturbance to nesting migratory birds should be avoided by conducting surface disturbing activities outside the migratory bird nesting season. If surface disturbing activities must be implemented during the nesting season, a preconstruction survey for nesting migratory birds should be performed by a qualified wildlife biologist, during the breeding season (if work is not completed within a specified time frame, then additional surveys may be needed). If active nests are found, an appropriately-sized no surface disturbance buffer determined in coordination with the BLM biologist should be placed on the active nest until the nesting attempt has been completed. If no active nests are found, construction activities must occur within the survey validity time frame specified in the conditions of approval.

LEASE NOTICE

Water

The Operator is responsible for compliance with provisions of the Clean Water Act, Safe Drinking Water Act, and applicable State laws and regulations regarding protection of state water resources. Operators should contact Utah Division of Water Resources and Utah Division of Environmental Protection regarding necessary permits and compliance measures for any construction or other activities.

UTUT105294998

LEASE NOTICE

Mining Claims

This parcel may contain existing mining claims and/or mill sites located under the 1872 Mining Law. To the extent it does, the oil and gas 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.

LEASE NOTICE

Water Resources (2008 ROD)

In coordination with State regulatory agencies the operator will comply with all State and Federal surface and ground water rules and regulations for all phases of geothermal exploration, development, and reclamation.

Operators will develop a storm water management plan for the site to ensure compliance with applicable regulations and prevent off- site migration of contaminated storm water or increased soil erosion.

Operators will gain a clear understanding of the local hydrogeology. Areas of groundwater discharge and recharge and their potential relationships with surface water bodies will be identified.

Operators will avoid creating hydrologic conduits between discrete aquifers during foundation excavation and other activities.

Freshwater-bearing and other usable water aquifers will be protected from contamination by assuring all well casing (excluding the liner) is required to be cemented from the casing shoe to the surface.

Periodic testing and monitoring via observation wells will be conducted in a manner to assure maximum protection of water resources from geothermal fluids or alterations in reservoir pressure.

UTUT105294998

LEASE NOTICE

Pronghorn Winter Habitat

The lessee/operator is given notice that lands in this lease have been identified as containing crucial pronghorn winter habitat. Surface use or otherwise disruptive activity may be restricted for up to 60 days during pronghorn fawning season, as determined by BLM, including exploration, drilling and other development activities. Modifications may be required in the Surface Use Plan of Operations including seasonal timing restrictions to protect the species and its habitat.

UTUT105294998

LEASE NOTICE

Pronghorn Fawning Habitat (Outside Moab MLP and areas defined in VFO, RFO, MbFO & MtFO stips)

The lessee/operator is given notice that this lease has been identified as containing crucial pronghorn fawning habitat. Surface use or otherwise disruptive activity may be restricted for up to 60 days during pronghorn fawning season, as determined by BLM within identified crucial/important pronghorn fawning habitat from disruptive activity. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

Bureau of Land Management

Cedar City Field Office

LEASE NOTICE

Raptors

Appropriate seasonal and spatial buffers shall be placed on all known raptor nests in accordance with Utah Field Office Guidelines for Raptor Protection from Human and Land use Disturbances (USFWS 2002) and Best Management Practices for Raptors and their Associated Habitats in Utah (BLM 2006). All construction related activities will not occur within these buffers if pre-construction monitoring indicates the nests are active, unless a site-specific evaluation for active nests is completed prior to construction and if a BLM wildlife biologist, in consultation with USFWS and UDWR, recommends that activities may be permitted within the buffer. The BLM will coordinate with the USFWS and UDWR and have a recommendation within 3-5 days of notification. Any construction activities authorized within a protective (spatial and seasonal) buffer for raptors will require an on-site monitor. Any indication that activities are adversely affecting the raptor and/or its' young the on-site monitor will suspend activities and contact the BLM Authorized Officer immediately. Construction may occur within the buffers of inactive nests. Construction activities may commence once monitoring of the active nest site determines that fledglings have left the nest and are no longer dependent on the nest site. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

LEASE NOTICE

Migratory Bird

The lessee/operator is given notice that surveys for nesting migratory birds may be required during migratory bird breeding season whenever surface disturbances and/or occupancy is proposed in association with fluid mineral exploration and development within priority habitats. Surveys should focus on identified priority bird species in Utah. Field surveys will be conducted as determined by the authorized officer of the Bureau of Land Management. Based on the result of the field survey, the authorized officer will determine appropriate buffers and timing limitations.

Bureau of Land Management

Cedar City Field Office

UTUT105294998

LEASE NOTICE

Fisheries (CCFO)

The lessee/operator is given notice that this lease has been identified as containing fisheries habitat. No surface use or otherwise disruptive activity allowed within 400 feet of live water or the reservoirs located in the Beaver and Sevier River drainages, Parowan and Cedar Valley drainages, or Pinto Creek/Newcastle Reservoir drainage in order to prevent fisheries degradation.

LEASE NOTICE

Utah Sensitive Species

The lessee/operator is given notice that no surface use or otherwise disruptive activity would be allowed that would result in direct disturbance to populations or individual special status plant and animal species, including those listed on the BLM sensitive species list and the Utah sensitive species list. The lessee/operator is also given notice that lands in this parcel have been identified as containing potential habitat for species on the Utah Sensitive Species List. Modifications to the Surface Use Plan of Operations may be required in order to protect these resources from surface disturbing activities in accordance with Section 6 of the lease terms, Endangered Species Act, Migratory Bird Treaty Act and 43CFR3101.1-2.

Bureau of Land Management

Cedar City Field Office

LEASE NOTICE

Special Status Plants: Not Federally Listed

The lessee/operator is given notice that lands in this lease have been identified as containing special status plants, not federally listed, and their habitats. Modifications to the Surface Use Plan of Operations may be required in order to protect the special status plants and/or habitat from surface disturbing activities in accordance with Section 6 of the lease terms, Endangered Species Act, and 43CFR3101.1-2.

LEASE NOTICE

Noxious Weeds

The lessee/operator is given notice that lands in this lease have been identified as containing or is near areas containing noxious weeds. Best management practices to prevent or control noxious weeds may be required for operations on the lease.

LEASE NOTICE

Riparian Areas

The lessee/operator is given notice that this lease has been identified as containing riparian areas. No surface use or otherwise disruptive activity allowed within 100 meters of riparian areas unless it can be shown that (1) there is no practicable alternative; (2) that all long-term impacts are fully mitigated; or (3) that the construction is an enhancement to the riparian areas. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

LEASE NOTICE

Floodplains (FFO)

The lessee/operator is given notice that lands in this lease could contain a floodplain and may require surveys to avoid adverse impact to the floodplain (520 DM 1). Developments should be located outside of the floodplain. Field surveys will be conducted as determined by the authorized officer of the Bureau of Land Management.

Bureau of Land Management

Cedar City Field Office

UTUT105294998

LEASE NOTICE

Water and Watershed Protection (CCFO)

The lessee/operator is given notice that this lease may need modifications to the Surface Use Plan of Operations in order to prevent water pollution and protect municipal and non-municipal watershed areas. No surface use or otherwise disruptive activity allowed within 500 feet of live water or the reservoirs located in the Beaver, Milford and Sevier River drainages, Parowan and Cedar Valley drainages, or Pinto Creek/Newcastle Reservoir drainage in order to prevent water quality degradation in accordance with section 6 of the lease terms and 43CFR3101.1-2.

LEASE NOTICE

Erodible Soils and Steep Slopes (CCFO, FFO)

The lessee/operator is given notice that the area is a municipal or non-municipal watershed and has steep slopes and erosive soils. New roads will be constructed to avoid soils that are highly erosive and / or in critical or severe erosion conditions. New roads will be constructed with water bars. Riprap may be required. Road grades in excess of 8 percent will normally not be allowed. In special circumstances, where a road grade of more than 10 percent is allowed, its maximum length will be 1,000 feet. Access grading along with exploration, drilling, construction, or other activities will be prohibited during wet or muddy conditions (usually during spring runoff and summer monsoon rains).
Based on the result of the field survey, the authorized officer will determine appropriate buffers and timing limitations. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

Bureau of Land Management

Cedar City Field Office

UTUT105294998

LEASE NOTICE

Steep Slopes (CCFO, FFO, MtFO, PFO, VFO, SLFO - Outside Moab MLP)

The lessee/operator is given notice that this lease has been identified as containing steep slopes. No surface use or otherwise disruptive activity allowed on slopes in excess of 30 percent without written permission from the Authorized Officer. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

UTUT105294998

LEASE NOTICE

National Historic Trails or Historic Properties (FFO)

The lessee/operator is given notice that lands in this lease have been identified as containing or is near a historic trail(s) or historic properties. After proper consultation, best management practices to prevent impacts to such resources may be required for operations on the lease.

Bureau of Land Management

Cedar City Field Office

UTUT105294998

LEASE NOTICE

Paleontological (CCFO)

The lessee/operator is given notice that this lease has been identified as containing paleontological resources. Surveys will be required whenever surface disturbances and/or occupancy is proposed in association with fluid mineral exploration and development within geological strata that may contain important paleontological resources. Field surveys will be conducted as determined by the authorized officer of the Bureau of Land Management. Exploration, drilling and other development activities may be restricted based on the result of the field survey; the authorized officer will determine appropriate mitigations. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

LEASE NOTICE

Air Quality Mitigation Measures

The lessee is given notice that the Bureau of Land Management (BLM) in coordination with the U.S. Environmental Protection Agency and the Utah Department of Air Quality, among others, has developed the following air quality mitigation measures that may be applied to any development proposed on this lease. Integration of and adherence to these measures may help minimize adverse local or regional air quality impacts from oil and gas development (including but not limited to construction, drilling, and production) on regional ozone formation.

- All internal combustion equipment would be kept in good working order.
- Water or other approved dust suppressants would be used at construction sites and along roads, as determined appropriate by the Authorized Officer.
- Open burning of garbage or refuse would not occur at well sites or other facilities.
- Drill rigs would be equipped with Tier II or better diesel engines.
- Vent emissions from stock tanks and natural gas TEG dehydrators would be controlled by routing the emissions to a flare or similar control device which would reduce emissions by 95% or greater.
- Low bleed or no bleed pneumatics would be installed on separator dump valves and other controllers.
- During completion, flaring would be limited as much as possible. Production equipment and gathering lines would be installed as soon as possible.
- Well site telemetry would be utilized as feasible for production operations.
- Stationary internal combustion engine would comply with the following standards: 2g NOx/bhp-hr for engines <300HP; and 1g NOx/bhp-hr for engines >300HP.

Additional site-specific measures may also be employed to avoid or minimize effects to local or regional air quality. These additional measures will be developed and implemented in coordination with the U.S. Environmental Protection Agency, the Utah Department of Air Quality, and other agencies with expertise or jurisdiction as appropriate based on the size of the project and magnitude of emissions.

LEASE NOTICE

Regional Ozone Formation Controls

To mitigate any potential impact oil and gas development emissions may have on regional ozone formation, the following Best Management Practices (BMPs) would be required for any development projects:

- Tier II or better drilling rig engines
- Stationary internal combustion engine standard of 2g NOx/bhp-hr for engines <300HP and 1g NOx/bhp-hr for engines >300HP
- Low bleed or no bleed pneumatic pump valves
- Dehydrator VOC emission controls to +95% efficiency
- Tank VOC emission controls to +95% efficiency

LEASE NOTICE

Air Quality (WDD, CoCD)

All new and replacement internal combustion gas field engines of less than or equal to 300 design-rated horsepower must not emit more than 2 grams of NOx per horsepower-hour. This requirement does not apply to gas field engines of less than or equal to 40 design-rated horsepower. AND All new and replacement internal combustion gas field engines of greater than 300 design rated horsepower must not emit more than 1.0 grams of NOx per horsepower-hour. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

Bureau of Land Management

Cedar City Field Office

UTUT105294998

LEASE NOTICE

Air Quality Analysis

The lessee/operator is given notice that prior to project-specific approval, additional air quality analyses may be required to comply with the National Environmental Policy Act, Federal Land Policy Management Act, and/or other applicable laws and regulations. Analyses may include dispersion modeling and/or photo-chemical modeling for deposition and visibility impacts analysis, control equipment determinations, and/or emission inventory development. These analyses may result in the imposition of additional project-specific air quality control measures.

LEASE NOTICE

Bald Eagle (Formerly T&E-01) (Outside Moab MLP)

The Lessee/Operator is given notice that the lands in this parcel contains nesting/winter roost habitat for the bald eagle. The bald eagle was de-listed in 2007; however, it is still afforded protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c, 1940). Therefore, avoidance or use restrictions may be placed on portions of the lease. Application of appropriate measures will depend on whether the action is temporary or permanent, and whether it occurs within or outside the bald eagle breeding or roosting season. A temporary action is completed prior to the following breeding or roosting season leaving no permanent structures and resulting in no permanent habitat loss. A permanent action continues for more than one breeding or roosting season and/or causes a loss of eagle habitat or displaces eagles through disturbances, i.e. creation of a permanent structure. The following avoidance and minimization measures have been designed to ensure activities carried out on the lease will not lead to the need to consider listing the eagle as threatened or endangered. Integration of, and adherence to the following measures will facilitate review and analysis of any submitted permits under the authority of this lease.
Current avoidance and minimization measures include the following:
1. Surveys will be required prior to operations unless species occupancy and distribution information is complete and available. All Surveys must be conducted by qualified individual(s), and be conducted according to protocol.
2. Lease activities will require monitoring throughout the duration of the project. To ensure desired results are being achieved, minimization measures will be evaluated.
3. Water production will be managed to ensure maintenance or enhancement of riparian habitat.
4. Temporary activities within 1.0 mile of nest sites will not occur during the breeding season of January 1 to August 31, unless the area has been surveyed according to protocol and determined to be unoccupied.
5. Temporary activities within 0.5 miles of winter roost areas, e.g., cottonwood galleries, will not occur during the winter roost season of November 1 to March 31, unless the area has been surveyed according to protocol and determined to be unoccupied.
6. No permanent infrastructure will be placed within 1.0 mile of nest sites.
7. No permanent infrastructure will be placed within 0.5 miles of winter roost areas.
8. Remove big game carrion from within 100 feet of lease roadways occurring within bald eagle foraging range.
9. Avoid loss or disturbance to large cottonwood gallery riparian habitats.
10. Where technically and economically feasible, use directional drilling or multiple wells from the same pad to reduce surface disturbance and eliminate

drilling in suitable habitat Utilize directional drilling to avoid direct impacts to large cottonwood gallery riparian habitats. Ensure that such directional drilling does not intercept or degrade alluvial aquifers.

11. All areas of surface disturbance within riparian areas and/or adjacent uplands should be re-vegetated with native species.

Additional measures may also be employed to avoid or minimize effects to the species between the lease sale stage and lease development stage. These additional measures will be developed and implemented in coordination with the U. S. Fish and Wildlife Service.

LEASE NOTICE

Floodplain Management

The lessee/operator is given notice that, in accordance with Executive Order 11988, to avoid adverse impact to floodplains 1) facilities should be located outside the 100 year floodplain, or 2) would be minimized or mitigated by modification of surface use plans within floodplains present within the lease.

Bureau of Land Management

Cedar City Field Office

UTUT105294998

LEASE NOTICE

Pollinators and Pollinator Habitat (Sept 2018 Price-Richfield Lease Sale EA)

In order to protect pollinators and pollinator habitat, in accordance with BLM policy outlined in Instruction Memorandum No. 2016-013, Managing for Pollinators on Public Lands, and Pollinator-Friendly Best Management Practices for Federal Lands (2015), the following avoidance, minimization, and mitigation measures would apply to this parcel:

1. Give a preference for placing well pads in previously disturbed areas, dry areas that do not support forbs, or areas dominated by nonnative grasses.
2. Utilize existing well pads where feasible.
3. Avoid disturbance to native milkweed patches within Monarch migration routes to protect Monarch butterfly habitat.
4. Avoid disturbance of riparian and meadow sites, as well as small depressed areas that may function as water catchments and host nectar-producing species, to protect Monarch butterfly habitat and nectaring sites.
5. Minimize the use of pesticides that negatively impact pollinators.
6. During revegetation treatments:

a. Use minimum till drills where feasible.

b. Include pollinator-friendly site-appropriate native plant seeds or seedlings in seed mixes.

c. Where possible, increase the cover and diversity of essential habitat components for native pollinators by:

□ Using site-appropriate milkweed seeds or seedlings within Monarch migration routes through priority sage-grouse habitat.

□ Using seed mixes with annual and short-lived perennial native forbs that will bloom the first year and provide forage for pollinators.

□ Using seed mixes with a variety of native forb species to ensure different colored and shaped flowers to provide nectar and pollen throughout the growing season for a variety of pollinators.

□ Seeding forbs in separate rows from grasses to avoid competition during establishment.

□ Avoiding seeding non-native forbs and grasses that establish early and out compete slower-growing natives.

LEASE NOTICE

Kit Fox Habitat

The lessee/operator is given notice that no surface disturbances would be allowed within 660 feet (200 meters) of an occupied natal kit fox den.

Bureau of Land Management

Cedar City Field Office

NSO - NATIONAL REGISTER OF HISTORIC PLACES, CULTURAL RESOURCES (SITES, STRUCTURES, OBJECTS, AND TRADITIONAL USE AREAS) (2008 ROD 2.3.2. NSO STIPS)

Stipulation: In accordance with the No Surface Occupancy Lease Stipulations in Section 2.3.2. of the December 2008 Bureau of Land Management Record of Decision for the Geothermal Leasing Environmental Impact Statement and the suggested mitigating measures, No Surface Occupancy within the boundary of properties designated or eligible for the National Register of Historic Places, including National Landmarks and National Register Districts and Sites, and additional lands outside the designated boundaries to the extent necessary to protect values where the setting and integrity is critical to their designation or eligibility.

Exception: The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource and/or the resource the resource is no longer National Register quality. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated negative impacts. An exception may be granted for actions designed to enhance the long-term utility or availability of the cultural resources.

Modification: The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

On the lands described below:

All Lands

NSO - TRADITIONAL CULTURAL PROPERTIES (2008 ROD 2.3.2. NSO STIPS)

Stipulation: In accordance with the No Surface Occupancy Lease Stipulations in Section 2.3.2. of the December 2008 Bureau of Land Management Record of Decision for the Geothermal Leasing Environmental Impact Statement and the suggested mitigating measures, No Surface Occupancy within areas with important cultural and archaeological resources, such as traditional cultural properties and Native American sacred sites, as identified through consultation.

Exception: None.

Modification: The Authorized Officer may modify the size and shape of the restricted area if through consultation and cultural analysis indicates the traditional cultural properties resource differs or changes.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

On the lands described below:

All Lands

NSO - RIPARIAN HABITAT (2008 ROD 2.3.2. NSO STIPS)

Stipulation: No Surface Occupancy (NSO) on and within riparian-wetland vegetated areas to protect the values and functions of these areas. To protect the values and functions of riparian and wetland areas based on the nature, extent, and value of the area potentially affected.

Exception: The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated negative impacts. An exception may be granted for actions designed to enhance the long-term utility or availability of the riparian habitat.

Modification: The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

On the lands described below:

All Lands

NSO - WATER BODIES, WETLANDS, AND/OR 100-YEAR FLOODPLAINS

Stipulation: No Surface Occupancy (NSO) on water bodies, wetlands and/or 100-year floodplains.

Exception: The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated negative impacts. An exception may be granted for actions designed to enhance the long-term utility or availability of the water bodies, wetlands, and/or 100-year floodplains resource.

Modification: The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

On the lands described below:

All Lands

TL - BALD EAGLE WINTER HABITAT

Stipulation: In order to protect important seasonal bald eagle winter habitat, exploration, drilling, and other development activity will be allowed during the period from May 1 through October 31. This imitation does not apply to maintenance and operation of producing wells.
Exception: Exceptions to this imitation in any year may be specifically authorized in writing by the authorized officer of the BLM.
Modification: None
Waiver: None

On the lands described below:

All Lands

TL - CRUCIAL DEER WINTER RANGE (WARM SPRINGS)

Stipulation: In order to protect the crucial Deer Winter Range, exploration, drilling, and other development activity will be allowed during the period from May 1 through December 30. This imitation does not apply to maintenance and operation of producing wells.
Exception: (Cedar City only) Exceptions to this imitation in any year may be specifically authorized in writing by the authorized officer of the BLM.
Modification: None
Waiver: None

On the lands described below:

All Lands

CULTURAL RESOURCE PROTECTION

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

On the lands described below:

All Lands

THREATENED AND ENDANGERED SPECIES ACT

Stipulation: The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. The BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that would contribute to a need to list such a species or their habitat. The 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. The BLM will not approve any ground-disturbing activity until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. § 1531 et seq. including completion of any required procedure for conference or consultation.

On the lands described below:

All Lands

CSU - RIPARIAN HABITAT BUFFER (2008 ROD 2.3.3. CSU STIPS)

Stipulation: Controlled Surface Use (CSU) will be applied within 500 feet of riparian-wetland vegetation to protect the values and functions of these areas. An engineering plan or a study may be required by the operator that identifies the extent of the resource or how the resource will be managed or protected. To protect the values and functions of riparian and wetland areas based on the nature, extent, and value of the area potentially affected.

Exception: The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated negative impacts. An exception may be granted for actions designed to enhance the long-term utility or availability of the riparian habitat.

Modification: The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

On the lands described below:

All Lands

LEASE NOTICE

Monitoring (2008 ROD BMPs)

Prior to geothermal exploration and development, a complete subsurface geotechnical investigation will be conducted to analyze the soil and geologic conditions. The investigation will evaluate and identify potential geologic hazards and would provide remedial grading recommendations, foundation and slab design criteria, and soil parameters for the design of geothermal power infrastructure.

The operator will collect available information describing the environmental and socio-cultural conditions in the vicinity of the proposed project and will provide the information to the agency.

A monitoring program will be developed by the operator to ensure that environmental conditions are monitored during the exploration and well drilling, testing, construction, and utilization and reclamation phases. The monitoring program requirements, including adaptive management strategies, will be established at the project level to ensure that potential adverse impacts of geothermal development are mitigated. The monitoring program will identify the monitoring requirements for each major environmental resource present at the site, establish metrics against which monitoring observations can be measured, identify potential mitigation measures, and establish protocols for incorporating monitoring observations and additional mitigation measures into ongoing activities. The operator will provide results of the monitoring program to the agency in an annual report.

The operator will comply with the Secretary of Agriculture's rules and regulations for all use and occupancy of the NFS lands prior to approval of an exploration plan by the Secretary of Interior and for uses of all existing improvements, such as forest development roads, within and outside the area permitted by the Secretary of Interior; and use and occupancy of the NFS lands not authorized by an exploration plan approved by the Secretary of Interior.

LEASE NOTICE

Paleontological and Cultural Resources (2008 ROD BMPs)

Before any specific permits are issued under leases, treatment of cultural resources will follow the procedures established by the Advisory Council on Historic Preservation for compliance with Section 106 of the National Historic Preservation Act. A pedestrian inventory will be undertaken of all portions that have not been previously surveyed or are identified by BLM as requiring inventory to identify properties that are eligible for the National Register of Historic Places (NRHP). Those sites not already evaluated for NRHP eligibility will be evaluated based on surface remains, subsurface testing, archival, and/or ethnographic sources. Subsurface testing will be kept to a minimum whenever possible if sufficient information is available to evaluate the site or if avoidance is an expected mitigation outcome. Recommendations regarding the eligibility of sites will be submitted to the BLM, and a treatment plan will be prepared to detail methods for avoidance of impacts or mitigation of effects. The BLM will make determinations of eligibility and effect and consult with SHPO as necessary based on each proposed lease application and project plans. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated. Avoidance of impacts through project design will be given priority over data recovery as the preferred mitigation measure. Avoidance measures include moving project elements away from site locations or to areas of previous impacts, restricting travel to existing roads, and maintaining barriers and signs in areas of cultural sensitivity. Any data recovery will be preceded by approval of a detailed research design, Native American Consultation, and other requirements for BLM issuance of a permit under the Archaeological Resources Protection Act (BLM 2007a).

If cultural resources are present at the site, or if areas with a high potential to contain cultural material have been identified, a cultural resources management plan (CRMP) will be developed. This plan will address mitigation activities to be taken for cultural resources found at the site. Avoidance of the area is always the preferred mitigation option. Other mitigation options include archaeological survey and excavation (as warranted) and monitoring. If an area exhibits a high potential, but no artifacts were observed during an archaeological survey, monitoring by a qualified archaeologist could be required during all excavation and earthmoving in the high- potential area. A report will be prepared documenting these activities. The CRMP also will (1) establish a monitoring program, (2) identify measures to prevent potential looting/vandalism or erosion impacts, and (3) address the education of workers and the public to make them aware of the consequences of unauthorized collection of artifacts and destruction of property on public land (BLM 2005).

Operators will determine whether paleontological resources exist in a project area on the basis of the sedimentary context of the area, a records search for past paleontological finds in the area, and/or, depending on the extent of existing information, a paleontological survey.

If paleontological resources are present at the site, or if areas with a high potential to contain paleontological material have been identified, a paleontological resources management plan will be developed. This plan will include a mitigation plan for avoidance, removal of fossils, or monitoring. If an area exhibits a high potential but no fossils were observed during survey, monitoring by a qualified paleontologist may be required during excavation and earthmoving in the sensitive area. The operator will submit a report to the agency documenting these activities. The paleontological resources management plan also will (1) establish a monitoring program, (2) identify measures to prevent potential looting/vandalism or erosion impacts, and (3) address the education of workers and the public to make them aware of the consequences of unauthorized collection of fossils on public land.

LEASE NOTICE

Geotechnical Analysis (2008 ROD)

The operator will perform a detailed geotechnical analysis prior to the construction of any structures; so, they will be sited to avoid any hazards from subsidence or liquefaction (i.e., the changing of a saturated soil from a relatively stable solid state to a liquid during earthquakes or nearby blasting).

LEASE NOTICE

Fossils

This area has low to moderate potential for vertebrate paleontological resources, unless noted to have higher potential in a separate stipulation. This area may contain vertebrate paleontological resources. Inventory and/or on-site monitoring during disturbance or spot checking may be required of the operator. 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. Operations within 250 feet of any such discovery will not be resumed until written authorization to proceed is issued by the Authorized Officer. The lessee will bear the cost of any required paleontological appraisals, surface collection of fossils, or salvage of any large conspicuous fossils of significant scientific interest discovered during the operations.

LEASE NOTICE

Migratory Birds

The Operator is responsible for compliance with provisions of the Migratory Bird Treaty Act by implementing measures to prevent take of migratory birds. Operators should be aware that any ground clearing or other disturbance (such as creating cross-country access to sites, drilling, and/or construction) during the migratory bird (including raptors) nesting season (March 1 -July 31) risks a violation of the Migratory Bird Treaty Act. Disturbance to nesting migratory birds should be avoided by conducting surface disturbing activities outside the migratory bird nesting season. If surface disturbing activities must be implemented during the nesting season, a preconstruction survey for nesting migratory birds should be performed by a qualified wildlife biologist, during the breeding season (if work is not completed within a specified time frame, then additional surveys may be needed). If active nests are found, an appropriately-sized no surface disturbance buffer determined in coordination with the BLM biologist should be placed on the active nest until the nesting attempt has been completed. If no active nests are found, construction activities must occur within the survey validity time frame specified in the conditions of approval.

LEASE NOTICE

Water

The Operator is responsible for compliance with provisions of the Clean Water Act, Safe Drinking Water Act, and applicable State laws and regulations regarding protection of state water resources. Operators should contact Utah Division of Water Resources and Utah Division of Environmental Protection regarding necessary permits and compliance measures for any construction or other activities.

LEASE NOTICE

Mining Claims

This parcel may contain existing mining claims and/or mill sites located under the 1872 Mining Law. To the extent it does, the oil and gas 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.

LEASE NOTICE

Water Resources (2008 ROD)

In coordination with State regulatory agencies the operator will comply with all State and Federal surface and ground water rules and regulations for all phases of geothermal exploration, development, and reclamation.

Operators will develop a storm water management plan for the site to ensure compliance with applicable regulations and prevent off- site migration of contaminated storm water or increased soil erosion.

Operators will gain a clear understanding of the local hydrogeology. Areas of groundwater discharge and recharge and their potential relationships with surface water bodies will be identified.

Operators will avoid creating hydrologic conduits between discrete aquifers during foundation excavation and other activities.

Freshwater-bearing and other usable water aquifers will be protected from contamination by assuring all well casing (excluding the liner) is required to be cemented from the casing shoe to the surface.

Periodic testing and monitoring via observation wells will be conducted in a manner to assure maximum protection of water resources from geothermal fluids or alterations in reservoir pressure.

LEASE NOTICE

Pronghorn Winter Habitat

The lessee/operator is given notice that lands in this lease have been identified as containing crucial pronghorn winter habitat. Surface use or otherwise disruptive activity may be restricted for up to 60 days during pronghorn fawning season, as determined by BLM, including exploration, drilling and other development activities. Modifications may be required in the Surface Use Plan of Operations including seasonal timing restrictions to protect the species and its habitat.

UTUT105294999

LEASE NOTICE

Pronghorn Fawning Habitat (Outside Moab MLP and areas defined in VFO, RFO, MbFO & MtFO stips)

The lessee/operator is given notice that this lease has been identified as containing crucial pronghorn fawning habitat. Surface use or otherwise disruptive activity may be restricted for up to 60 days during pronghorn fawning season, as determined by BLM within identified crucial/important pronghorn fawning habitat from disruptive activity. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

UTUT105294999

LEASE NOTICE

Rocky Mountain/Desert Bighorn Sheep Crucial Lambing and Rutting Habitat

The Lessee/Operator is given notice that the lands in this parcel contains habitat for bighorn sheep. Modifications to the surface use plan may be required in order to protect habitat from surface disturbing activities. Surface use or otherwise disruptive activity may be restricted for up to 60 days during pronghorn fawning season, as determined by BLM. These modifications may include such measures as timing restrictions to avoid surface use during the crucial lambing and rutting seasons. Measure may also include avoidance of certain areas such as water sources and talus slopes.

Bureau of Land Management

Cedar City Field Office

LEASE NOTICE

Raptors

Appropriate seasonal and spatial buffers shall be placed on all known raptor nests in accordance with Utah Field Office Guidelines for Raptor Protection from Human and Land use Disturbances (USFWS 2002) and Best Management Practices for Raptors and their Associated Habitats in Utah (BLM 2006). All construction related activities will not occur within these buffers if pre-construction monitoring indicates the nests are active, unless a site-specific evaluation for active nests is completed prior to construction and if a BLM wildlife biologist, in consultation with USFWS and UDWR, recommends that activities may be permitted within the buffer. The BLM will coordinate with the USFWS and UDWR and have a recommendation within 3-5 days of notification. Any construction activities authorized within a protective (spatial and seasonal) buffer for raptors will require an on-site monitor. Any indication that activities are adversely affecting the raptor and/or its' young the on-site monitor will suspend activities and contact the BLM Authorized Officer immediately. Construction may occur within the buffers of inactive nests. Construction activities may commence once monitoring of the active nest site determines that fledglings have left the nest and are no longer dependent on the nest site. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

LEASE NOTICE

Migratory Bird

The lessee/operator is given notice that surveys for nesting migratory birds may be required during migratory bird breeding season whenever surface disturbances and/or occupancy is proposed in association with fluid mineral exploration and development within priority habitats. Surveys should focus on identified priority bird species in Utah. Field surveys will be conducted as determined by the authorized officer of the Bureau of Land Management. Based on the result of the field survey, the authorized officer will determine appropriate buffers and timing limitations.

UTUT105294999

LEASE NOTICE

Fisheries (CCFO)

The lessee/operator is given notice that this lease has been identified as containing fisheries habitat. No surface use or otherwise disruptive activity allowed within 400 feet of live water or the reservoirs located in the Beaver and Sevier River drainages, Parowan and Cedar Valley drainages, or Pinto Creek/Newcastle Reservoir drainage in order to prevent fisheries degradation.

LEASE NOTICE

Utah Sensitive Species

The lessee/operator is given notice that no surface use or otherwise disruptive activity would be allowed that would result in direct disturbance to populations or individual special status plant and animal species, including those listed on the BLM sensitive species list and the Utah sensitive species list. The lessee/operator is also given notice that lands in this parcel have been identified as containing potential habitat for species on the Utah Sensitive Species List. Modifications to the Surface Use Plan of Operations may be required in order to protect these resources from surface disturbing activities in accordance with Section 6 of the lease terms, Endangered Species Act, Migratory Bird Treaty Act and 43CFR3101.1-2.

Bureau of Land Management

Cedar City Field Office

LEASE NOTICE

Special Status Plants: Not Federally Listed

The lessee/operator is given notice that lands in this lease have been identified as containing special status plants, not federally listed, and their habitats. Modifications to the Surface Use Plan of Operations may be required in order to protect the special status plants and/or habitat from surface disturbing activities in accordance with Section 6 of the lease terms, Endangered Species Act, and 43CFR3101.1-2.

LEASE NOTICE

Noxious Weeds

The lessee/operator is given notice that lands in this lease have been identified as containing or is near areas containing noxious weeds. Best management practices to prevent or control noxious weeds may be required for operations on the lease.

LEASE NOTICE

Riparian Areas

The lessee/operator is given notice that this lease has been identified as containing riparian areas. No surface use or otherwise disruptive activity allowed within 100 meters of riparian areas unless it can be shown that (1) there is no practicable alternative; (2) that all long-term impacts are fully mitigated; or (3) that the construction is an enhancement to the riparian areas. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

LEASE NOTICE

Floodplains (FFO)

The lessee/operator is given notice that lands in this lease could contain a floodplain and may require surveys to avoid adverse impact to the floodplain (520 DM 1). Developments should be located outside of the floodplain. Field surveys will be conducted as determined by the authorized officer of the Bureau of Land Management.

UTUT105294999

LEASE NOTICE

Water and Watershed Protection (CCFO)

The lessee/operator is given notice that this lease may need modifications to the Surface Use Plan of Operations in order to prevent water pollution and protect municipal and non-municipal watershed areas. No surface use or otherwise disruptive activity allowed within 500 feet of live water or the reservoirs located in the Beaver, Milford and Sevier River drainages, Parowan and Cedar Valley drainages, or Pinto Creek/Newcastle Reservoir drainage in order to prevent water quality degradation in accordance with section 6 of the lease terms and 43CFR3101.1-2.

LEASE NOTICE

Erodible Soils and Steep Slopes (CCFO, FFO)

The lessee/operator is given notice that the area is a municipal or non-municipal watershed and has steep slopes and erosive soils. New roads will be constructed to avoid soils that are highly erosive and / or in critical or severe erosion conditions. New roads will be constructed with water bars. Riprap may be required. Road grades in excess of 8 percent will normally not be allowed. In special circumstances, where a road grade of more than 10 percent is allowed, its maximum length will be 1,000 feet. Access grading along with exploration, drilling, construction, or other activities will be prohibited during wet or muddy conditions (usually during spring runoff and summer monsoon rains). Based on the result of the field survey, the authorized officer will determine appropriate buffers and timing limitations. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

Bureau of Land Management

Cedar City Field Office

LEASE NOTICE

Air Quality Mitigation Measures

The lessee is given notice that the Bureau of Land Management (BLM) in coordination with the U.S. Environmental Protection Agency and the Utah Department of Air Quality, among others, has developed the following air quality mitigation measures that may be applied to any development proposed on this lease. Integration of and adherence to these measures may help minimize adverse local or regional air quality impacts from oil and gas development (including but not limited to construction, drilling, and production) on regional ozone formation.

- All internal combustion equipment would be kept in good working order.
- Water or other approved dust suppressants would be used at construction sites and along roads, as determined appropriate by the Authorized Officer.
- Open burning of garbage or refuse would not occur at well sites or other facilities.
- Drill rigs would be equipped with Tier II or better diesel engines.
- Vent emissions from stock tanks and natural gas TEG dehydrators would be controlled by routing the emissions to a flare or similar control device which would reduce emissions by 95% or greater.
- Low bleed or no bleed pneumatics would be installed on separator dump valves and other controllers.
- During completion, flaring would be limited as much as possible. Production equipment and gathering lines would be installed as soon as possible.
- Well site telemetry would be utilized as feasible for production operations.
- Stationary internal combustion engine would comply with the following standards: 2g NOx/bhp-hr for engines <300HP; and 1g NOx/bhp-hr for engines >300HP.

Additional site-specific measures may also be employed to avoid or minimize effects to local or regional air quality. These additional measures will be developed and implemented in coordination with the U.S. Environmental Protection Agency, the Utah Department of Air Quality, and other agencies with expertise or jurisdiction as appropriate based on the size of the project and magnitude of emissions.

LEASE NOTICE

Regional Ozone Formation Controls

To mitigate any potential impact oil and gas development emissions may have on regional ozone formation, the following Best Management Practices (BMPs) would be required for any development projects:

- Tier II or better drilling rig engines
- Stationary internal combustion engine standard of 2g NOx/bhp-hr for engines <300HP and 1g NOx/bhp-hr for engines >300HP
- Low bleed or no bleed pneumatic pump valves
- Dehydrator VOC emission controls to +95% efficiency
- Tank VOC emission controls to +95% efficiency

Bureau of Land Management

Cedar City Field Office

UTUT105294999

LEASE NOTICE

Air Quality (WDD, CoCD)

All new and replacement internal combustion gas field engines of less than or equal to 300 design-rated horsepower must not emit more than 2 grams of NOx per horsepower-hour. This requirement does not apply to gas field engines of less than or equal to 40 design-rated horsepower. AND All new and replacement internal combustion gas field engines of greater than 300 design rated horsepower must not emit more than 1.0 grams of NOx per horsepower-hour. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

LEASE NOTICE

Air Quality Analysis

The lessee/operator is given notice that prior to project-specific approval, additional air quality analyses may be required to comply with the National Environmental Policy Act, Federal Land Policy Management Act, and/or other applicable laws and regulations. Analyses may include dispersion modeling and/or photo-chemical modeling for deposition and visibility impacts analysis, control equipment determinations, and/or emission inventory development. These analyses may result in the imposition of additional project-specific air quality control measures.

Bureau of Land Management

Cedar City Field Office

LEASE NOTICE

Bald Eagle (Formerly T&E-01) (Outside Moab MLP)

The Lessee/Operator is given notice that the lands in this parcel contains nesting/winter roost habitat for the bald eagle. The bald eagle was de-listed in 2007; however, it is still afforded protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c, 1940). Therefore, avoidance or use restrictions may be placed on portions of the lease. Application of appropriate measures will depend on whether the action is temporary or permanent, and whether it occurs within or outside the bald eagle breeding or roosting season. A temporary action is completed prior to the following breeding or roosting season leaving no permanent structures and resulting in no permanent habitat loss. A permanent action continues for more than one breeding or roosting season and/or causes a loss of eagle habitat or displaces eagles through disturbances, i.e. creation of a permanent structure. The following avoidance and minimization measures have been designed to ensure activities carried out on the lease will not lead to the need to consider listing the eagle as threatened or endangered. Integration of, and adherence to the following measures will facilitate review and analysis of any submitted permits under the authority of this lease.
Current avoidance and minimization measures include the following:
1. Surveys will be required prior to operations unless species occupancy and distribution information is complete and available. All Surveys must be conducted by qualified individual(s), and be conducted according to protocol.
2. Lease activities will require monitoring throughout the duration of the project. To ensure desired results are being achieved, minimization measures will be evaluated.
3. Water production will be managed to ensure maintenance or enhancement of riparian habitat.
4. Temporary activities within 1.0 mile of nest sites will not occur during the breeding season of January 1 to August 31, unless the area has been surveyed according to protocol and determined to be unoccupied.
5. Temporary activities within 0.5 miles of winter roost areas, e.g., cottonwood galleries, will not occur during the winter roost season of November 1 to March 31, unless the area has been surveyed according to protocol and determined to be unoccupied.
6. No permanent infrastructure will be placed within 1.0 mile of nest sites.
7. No permanent infrastructure will be placed within 0.5 miles of winter roost areas.
8. Remove big game carrion from within 100 feet of lease roadways occurring within bald eagle foraging range.
9. Avoid loss or disturbance to large cottonwood gallery riparian habitats.
10. Where technically and economically feasible, use directional drilling or multiple wells from the same pad to reduce surface disturbance and eliminate

drilling in suitable habitat Utilize directional drilling to avoid direct impacts to large cottonwood gallery riparian habitats. Ensure that such directional drilling does not intercept or degrade alluvial aquifers.

11. All areas of surface disturbance within riparian areas and/or adjacent uplands should be re-vegetated with native species.

Additional measures may also be employed to avoid or minimize effects to the species between the lease sale stage and lease development stage. These additional measures will be developed and implemented in coordination with the U. S. Fish and Wildlife Service.

UTUT105294999

LEASE NOTICE

Floodplain Management

The lessee/operator is given notice that, in accordance with Executive Order 11988, to avoid adverse impact to floodplains 1) facilities should be located outside the 100 year floodplain, or 2) would be minimized or mitigated by modification of surface use plans within floodplains present within the lease.

LEASE NOTICE

Pollinators and Pollinator Habitat (Sept 2018 Price-Richfield Lease Sale EA)

In order to protect pollinators and pollinator habitat, in accordance with BLM policy outlined in Instruction Memorandum No. 2016-013, Managing for Pollinators on Public Lands, and Pollinator-Friendly Best Management Practices for Federal Lands (2015), the following avoidance, minimization, and mitigation measures would apply to this parcel:

1. Give a preference for placing well pads in previously disturbed areas, dry areas that do not support forbs, or areas dominated by nonnative grasses.
2. Utilize existing well pads where feasible.
3. Avoid disturbance to native milkweed patches within Monarch migration routes to protect Monarch butterfly habitat.
4. Avoid disturbance of riparian and meadow sites, as well as small depressed areas that may function as water catchments and host nectar-producing species, to protect Monarch butterfly habitat and nectaring sites.
5. Minimize the use of pesticides that negatively impact pollinators.
6. During revegetation treatments:

a. Use minimum till drills where feasible.

b. Include pollinator-friendly site-appropriate native plant seeds or seedlings in seed mixes.

c. Where possible, increase the cover and diversity of essential habitat components for native pollinators by:

□ Using site-appropriate milkweed seeds or seedlings within Monarch migration routes through priority sage-grouse habitat.

□ Using seed mixes with annual and short-lived perennial native forbs that will bloom the first year and provide forage for pollinators.

□ Using seed mixes with a variety of native forb species to ensure different colored and shaped flowers to provide nectar and pollen throughout the growing season for a variety of pollinators.

□ Seeding forbs in separate rows from grasses to avoid competition during establishment.

□ Avoiding seeding non-native forbs and grasses that establish early and out compete slower-growing natives.

Bureau of Land Management

Cedar City Field Office

UTUT105294999

LEASE NOTICE

Kit Fox Habitat

The lessee/operator is given notice that no surface disturbances would be allowed within 660 feet (200 meters) of an occupied natal kit fox den.

NSO - NATIONAL REGISTER OF HISTORIC PLACES, CULTURAL RESOURCES (SITES, STRUCTURES, OBJECTS, AND TRADITIONAL USE AREAS) (2008 ROD 2.3.2. NSO STIPS)

Stipulation: In accordance with the No Surface Occupancy Lease Stipulations in Section 2.3.2. of the December 2008 Bureau of Land Management Record of Decision for the Geothermal Leasing Environmental Impact Statement and the suggested mitigating measures, No Surface Occupancy within the boundary of properties designated or eligible for the National Register of Historic Places, including National Landmarks and National Register Districts and Sites, and additional lands outside the designated boundaries to the extent necessary to protect values where the setting and integrity is critical to their designation or eligibility.

Exception: The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource and/or the resource the resource is no longer National Register quality. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated negative impacts. An exception may be granted for actions designed to enhance the long-term utility or availability of the cultural resources.

Modification: The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

On the lands described below:

All Lands

NSO - TRADITIONAL CULTURAL PROPERTIES (2008 ROD 2.3.2. NSO STIPS)

Stipulation: In accordance with the No Surface Occupancy Lease Stipulations in Section 2.3.2. of the December 2008 Bureau of Land Management Record of Decision for the Geothermal Leasing Environmental Impact Statement and the suggested mitigating measures, No Surface Occupancy within areas with important cultural and archaeological resources, such as traditional cultural properties and Native American sacred sites, as identified through consultation.

Exception: None.

Modification: The Authorized Officer may modify the size and shape of the restricted area if through consultation and cultural analysis indicates the traditional cultural properties resource differs or changes.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

On the lands described below:

All Lands

NSO - RIPARIAN HABITAT (2008 ROD 2.3.2. NSO STIPS)

Stipulation: No Surface Occupancy (NSO) on and within riparian-wetland vegetated areas to protect the values and functions of these areas. To protect the values and functions of riparian and wetland areas based on the nature, extent, and value of the area potentially affected.

Exception: The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated negative impacts. An exception may be granted for actions designed to enhance the long-term utility or availability of the riparian habitat.

Modification: The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

On the lands described below:

All Lands

NSO - WATER BODIES, WETLANDS, AND/OR 100-YEAR FLOODPLAINS

Stipulation: No Surface Occupancy (NSO) on water bodies, wetlands and/or 100-year floodplains.

Exception: The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated negative impacts. An exception may be granted for actions designed to enhance the long-term utility or availability of the water bodies, wetlands, and/or 100-year floodplains resource.

Modification: The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

On the lands described below:

All Lands

TL - BALD EAGLE WINTER HABITAT

Stipulation: In order to protect important seasonal bald eagle winter habitat, exploration, drilling, and other development activity will be allowed during the period from May 1 through October 31. This imitation does not apply to maintenance and operation of producing wells.
Exception: Exceptions to this imitation in any year may be specifically authorized in writing by the authorized officer of the BLM.
Modification: None
Waiver: None

On the lands described below:

All Lands

TL - CRUCIAL DEER WINTER RANGE (WARM SPRINGS)

Stipulation: In order to protect the crucial Deer Winter Range, exploration, drilling, and other development activity will be allowed during the period from May 1 through December 30. This imitation does not apply to maintenance and operation of producing wells.
Exception: (Cedar City only) Exceptions to this imitation in any year may be specifically authorized in writing by the authorized officer of the BLM.
Modification: None
Waiver: None

On the lands described below:

All Lands

CULTURAL RESOURCE PROTECTION

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

On the lands described below:

All Lands

THREATENED AND ENDANGERED SPECIES ACT

Stipulation: The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. The BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that would contribute to a need to list such a species or their habitat. The 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. The BLM will not approve any ground-disturbing activity until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. § 1531 et seq. including completion of any required procedure for conference or consultation.

On the lands described below:

All Lands

CSU - RIPARIAN HABITAT BUFFER (2008 ROD 2.3.3. CSU STIPS)

Stipulation: Controlled Surface Use (CSU) will be applied within 500 feet of riparian-wetland vegetation to protect the values and functions of these areas. An engineering plan or a study may be required by the operator that identifies the extent of the resource or how the resource will be managed or protected. To protect the values and functions of riparian and wetland areas based on the nature, extent, and value of the area potentially affected.

Exception: The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated negative impacts. An exception may be granted for actions designed to enhance the long-term utility or availability of the riparian habitat.

Modification: The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

On the lands described below:

All Lands

LEASE NOTICE

Monitoring (2008 ROD BMPs)

Prior to geothermal exploration and development, a complete subsurface geotechnical investigation will be conducted to analyze the soil and geologic conditions. The investigation will evaluate and identify potential geologic hazards and would provide remedial grading recommendations, foundation and slab design criteria, and soil parameters for the design of geothermal power infrastructure.

The operator will collect available information describing the environmental and socio-cultural conditions in the vicinity of the proposed project and will provide the information to the agency.

A monitoring program will be developed by the operator to ensure that environmental conditions are monitored during the exploration and well drilling, testing, construction, and utilization and reclamation phases. The monitoring program requirements, including adaptive management strategies, will be established at the project level to ensure that potential adverse impacts of geothermal development are mitigated. The monitoring program will identify the monitoring requirements for each major environmental resource present at the site, establish metrics against which monitoring observations can be measured, identify potential mitigation measures, and establish protocols for incorporating monitoring observations and additional mitigation measures into ongoing activities. The operator will provide results of the monitoring program to the agency in an annual report.

The operator will comply with the Secretary of Agriculture's rules and regulations for all use and occupancy of the NFS lands prior to approval of an exploration plan by the Secretary of Interior and for uses of all existing improvements, such as forest development roads, within and outside the area permitted by the Secretary of Interior; and use and occupancy of the NFS lands not authorized by an exploration plan approved by the Secretary of Interior.

LEASE NOTICE

Paleontological and Cultural Resources (2008 ROD BMPs)

Before any specific permits are issued under leases, treatment of cultural resources will follow the procedures established by the Advisory Council on Historic Preservation for compliance with Section 106 of the National Historic Preservation Act. A pedestrian inventory will be undertaken of all portions that have not been previously surveyed or are identified by BLM as requiring inventory to identify properties that are eligible for the National Register of Historic Places (NRHP). Those sites not already evaluated for NRHP eligibility will be evaluated based on surface remains, subsurface testing, archival, and/or ethnographic sources. Subsurface testing will be kept to a minimum whenever possible if sufficient information is available to evaluate the site or if avoidance is an expected mitigation outcome. Recommendations regarding the eligibility of sites will be submitted to the BLM, and a treatment plan will be prepared to detail methods for avoidance of impacts or mitigation of effects. The BLM will make determinations of eligibility and effect and consult with SHPO as necessary based on each proposed lease application and project plans. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated. Avoidance of impacts through project design will be given priority over data recovery as the preferred mitigation measure. Avoidance measures include moving project elements away from site locations or to areas of previous impacts, restricting travel to existing roads, and maintaining barriers and signs in areas of cultural sensitivity. Any data recovery will be preceded by approval of a detailed research design, Native American Consultation, and other requirements for BLM issuance of a permit under the Archaeological Resources Protection Act (BLM 2007a).

If cultural resources are present at the site, or if areas with a high potential to contain cultural material have been identified, a cultural resources management plan (CRMP) will be developed. This plan will address mitigation activities to be taken for cultural resources found at the site. Avoidance of the area is always the preferred mitigation option. Other mitigation options include archaeological survey and excavation (as warranted) and monitoring. If an area exhibits a high potential, but no artifacts were observed during an archaeological survey, monitoring by a qualified archaeologist could be required during all excavation and earthmoving in the high- potential area. A report will be prepared documenting these activities. The CRMP also will (1) establish a monitoring program, (2) identify measures to prevent potential looting/vandalism or erosion impacts, and (3) address the education of workers and the public to make them aware of the consequences of unauthorized collection of artifacts and destruction of property on public land (BLM 2005).

Operators will determine whether paleontological resources exist in a project area on the basis of the sedimentary context of the area, a records search for past paleontological finds in the area, and/or, depending on the extent of existing information, a paleontological survey.

If paleontological resources are present at the site, or if areas with a high potential to contain paleontological material have been identified, a paleontological resources management plan will be developed. This plan will include a mitigation plan for avoidance, removal of fossils, or monitoring. If an area exhibits a high potential but no fossils were observed during survey, monitoring by a qualified paleontologist may be required during excavation and earthmoving in the sensitive area. The operator will submit a report to the agency documenting these activities. The paleontological resources management plan also will (1) establish a monitoring program, (2) identify measures to prevent potential looting/vandalism or erosion impacts, and (3) address the education of workers and the public to make them aware of the consequences of unauthorized collection of fossils on public land.

LEASE NOTICE

Geotechnical Analysis (2008 ROD)

The operator will perform a detailed geotechnical analysis prior to the construction of any structures; so, they will be sited to avoid any hazards from subsidence or liquefaction (i.e., the changing of a saturated soil from a relatively stable solid state to a liquid during earthquakes or nearby blasting).

LEASE NOTICE

Fossils

This area has low to moderate potential for vertebrate paleontological resources, unless noted to have higher potential in a separate stipulation. This area may contain vertebrate paleontological resources. Inventory and/or on-site monitoring during disturbance or spot checking may be required of the operator. 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. Operations within 250 feet of any such discovery will not be resumed until written authorization to proceed is issued by the Authorized Officer. The lessee will bear the cost of any required paleontological appraisals, surface collection of fossils, or salvage of any large conspicuous fossils of significant scientific interest discovered during the operations.

LEASE NOTICE

Migratory Birds

The Operator is responsible for compliance with provisions of the Migratory Bird Treaty Act by implementing measures to prevent take of migratory birds. Operators should be aware that any ground clearing or other disturbance (such as creating cross-country access to sites, drilling, and/or construction) during the migratory bird (including raptors) nesting season (March 1 -July 31) risks a violation of the Migratory Bird Treaty Act. Disturbance to nesting migratory birds should be avoided by conducting surface disturbing activities outside the migratory bird nesting season. If surface disturbing activities must be implemented during the nesting season, a preconstruction survey for nesting migratory birds should be performed by a qualified wildlife biologist, during the breeding season (if work is not completed within a specified time frame, then additional surveys may be needed). If active nests are found, an appropriately-sized no surface disturbance buffer determined in coordination with the BLM biologist should be placed on the active nest until the nesting attempt has been completed. If no active nests are found, construction activities must occur within the survey validity time frame specified in the conditions of approval.

LEASE NOTICE

Water

The Operator is responsible for compliance with provisions of the Clean Water Act, Safe Drinking Water Act, and applicable State laws and regulations regarding protection of state water resources. Operators should contact Utah Division of Water Resources and Utah Division of Environmental Protection regarding necessary permits and compliance measures for any construction or other activities.

LEASE NOTICE

Mining Claims

This parcel may contain existing mining claims and/or mill sites located under the 1872 Mining Law. To the extent it does, the oil and gas 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.

LEASE NOTICE

Water Resources (2008 ROD)

In coordination with State regulatory agencies the operator will comply with all State and Federal surface and ground water rules and regulations for all phases of geothermal exploration, development, and reclamation.

Operators will develop a storm water management plan for the site to ensure compliance with applicable regulations and prevent off- site migration of contaminated storm water or increased soil erosion.

Operators will gain a clear understanding of the local hydrogeology. Areas of groundwater discharge and recharge and their potential relationships with surface water bodies will be identified.

Operators will avoid creating hydrologic conduits between discrete aquifers during foundation excavation and other activities.

Freshwater-bearing and other usable water aquifers will be protected from contamination by assuring all well casing (excluding the liner) is required to be cemented from the casing shoe to the surface.

Periodic testing and monitoring via observation wells will be conducted in a manner to assure maximum protection of water resources from geothermal fluids or alterations in reservoir pressure.

LEASE NOTICE

Pronghorn Winter Habitat

The lessee/operator is given notice that lands in this lease have been identified as containing crucial pronghorn winter habitat. Surface use or otherwise disruptive activity may be restricted for up to 60 days during pronghorn fawning season, as determined by BLM, including exploration, drilling and other development activities. Modifications may be required in the Surface Use Plan of Operations including seasonal timing restrictions to protect the species and its habitat.

UTUT105295000

LEASE NOTICE

Pronghorn Fawning Habitat (Outside Moab MLP and areas defined in VFO, RFO, MbFO & MtFO stips)

The lessee/operator is given notice that this lease has been identified as containing crucial pronghorn fawning habitat. Surface use or otherwise disruptive activity may be restricted for up to 60 days during pronghorn fawning season, as determined by BLM within identified crucial/important pronghorn fawning habitat from disruptive activity. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

LEASE NOTICE

Raptors

Appropriate seasonal and spatial buffers shall be placed on all known raptor nests in accordance with Utah Field Office Guidelines for Raptor Protection from Human and Land use Disturbances (USFWS 2002) and Best Management Practices for Raptors and their Associated Habitats in Utah (BLM 2006). All construction related activities will not occur within these buffers if pre-construction monitoring indicates the nests are active, unless a site-specific evaluation for active nests is completed prior to construction and if a BLM wildlife biologist, in consultation with USFWS and UDWR, recommends that activities may be permitted within the buffer. The BLM will coordinate with the USFWS and UDWR and have a recommendation within 3-5 days of notification. Any construction activities authorized within a protective (spatial and seasonal) buffer for raptors will require an on-site monitor. Any indication that activities are adversely affecting the raptor and/or its' young the on-site monitor will suspend activities and contact the BLM Authorized Officer immediately. Construction may occur within the buffers of inactive nests. Construction activities may commence once monitoring of the active nest site determines that fledglings have left the nest and are no longer dependent on the nest site. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

LEASE NOTICE

Migratory Bird

The lessee/operator is given notice that surveys for nesting migratory birds may be required during migratory bird breeding season whenever surface disturbances and/or occupancy is proposed in association with fluid mineral exploration and development within priority habitats. Surveys should focus on identified priority bird species in Utah. Field surveys will be conducted as determined by the authorized officer of the Bureau of Land Management. Based on the result of the field survey, the authorized officer will determine appropriate buffers and timing limitations.

UTUT105295000

LEASE NOTICE

Fisheries (CCFO)

The lessee/operator is given notice that this lease has been identified as containing fisheries habitat. No surface use or otherwise disruptive activity allowed within 400 feet of live water or the reservoirs located in the Beaver and Sevier River drainages, Parowan and Cedar Valley drainages, or Pinto Creek/Newcastle Reservoir drainage in order to prevent fisheries degradation.

LEASE NOTICE

Utah Sensitive Species

The lessee/operator is given notice that no surface use or otherwise disruptive activity would be allowed that would result in direct disturbance to populations or individual special status plant and animal species, including those listed on the BLM sensitive species list and the Utah sensitive species list. The lessee/operator is also given notice that lands in this parcel have been identified as containing potential habitat for species on the Utah Sensitive Species List. Modifications to the Surface Use Plan of Operations may be required in order to protect these resources from surface disturbing activities in accordance with Section 6 of the lease terms, Endangered Species Act, Migratory Bird Treaty Act and 43CFR3101.1-2.

LEASE NOTICE

Special Status Plants: Not Federally Listed

The lessee/operator is given notice that lands in this lease have been identified as containing special status plants, not federally listed, and their habitats. Modifications to the Surface Use Plan of Operations may be required in order to protect the special status plants and/or habitat from surface disturbing activities in accordance with Section 6 of the lease terms, Endangered Species Act, and 43CFR3101.1-2.

LEASE NOTICE

Noxious Weeds

The lessee/operator is given notice that lands in this lease have been identified as containing or is near areas containing noxious weeds. Best management practices to prevent or control noxious weeds may be required for operations on the lease.

LEASE NOTICE

Riparian Areas

The lessee/operator is given notice that this lease has been identified as containing riparian areas. No surface use or otherwise disruptive activity allowed within 100 meters of riparian areas unless it can be shown that (1) there is no practicable alternative; (2) that all long-term impacts are fully mitigated; or (3) that the construction is an enhancement to the riparian areas. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

LEASE NOTICE

Floodplains (FFO)

The lessee/operator is given notice that lands in this lease could contain a floodplain and may require surveys to avoid adverse impact to the floodplain (520 DM 1). Developments should be located outside of the floodplain. Field surveys will be conducted as determined by the authorized officer of the Bureau of Land Management.

UTUT105295000

LEASE NOTICE

Water and Watershed Protection (CCFO)

The lessee/operator is given notice that this lease may need modifications to the Surface Use Plan of Operations in order to prevent water pollution and protect municipal and non-municipal watershed areas. No surface use or otherwise disruptive activity allowed within 500 feet of live water or the reservoirs located in the Beaver, Milford and Sevier River drainages, Parowan and Cedar Valley drainages, or Pinto Creek/Newcastle Reservoir drainage in order to prevent water quality degradation in accordance with section 6 of the lease terms and 43CFR3101.1-2.

LEASE NOTICE

Paleontological (CCFO)

The lessee/operator is given notice that this lease has been identified as containing paleontological resources. Surveys will be required whenever surface disturbances and/or occupancy is proposed in association with fluid mineral exploration and development within geological strata that may contain important paleontological resources. Field surveys will be conducted as determined by the authorized officer of the Bureau of Land Management. Exploration, drilling and other development activities may be restricted based on the result of the field survey; the authorized officer will determine appropriate mitigations. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

LEASE NOTICE

Air Quality Mitigation Measures

The lessee is given notice that the Bureau of Land Management (BLM) in coordination with the U.S. Environmental Protection Agency and the Utah Department of Air Quality, among others, has developed the following air quality mitigation measures that may be applied to any development proposed on this lease. Integration of and adherence to these measures may help minimize adverse local or regional air quality impacts from oil and gas development (including but not limited to construction, drilling, and production) on regional ozone formation.

- All internal combustion equipment would be kept in good working order.
- Water or other approved dust suppressants would be used at construction sites and along roads, as determined appropriate by the Authorized Officer.
- Open burning of garbage or refuse would not occur at well sites or other facilities.
- Drill rigs would be equipped with Tier II or better diesel engines.
- Vent emissions from stock tanks and natural gas TEG dehydrators would be controlled by routing the emissions to a flare or similar control device which would reduce emissions by 95% or greater.
- Low bleed or no bleed pneumatics would be installed on separator dump valves and other controllers.
- During completion, flaring would be limited as much as possible. Production equipment and gathering lines would be installed as soon as possible.
- Well site telemetry would be utilized as feasible for production operations.
- Stationary internal combustion engine would comply with the following standards: 2g NOx/bhp-hr for engines <300HP; and 1g NOx/bhp-hr for engines >300HP.

Additional site-specific measures may also be employed to avoid or minimize effects to local or regional air quality. These additional measures will be developed and implemented in coordination with the U.S. Environmental Protection Agency, the Utah Department of Air Quality, and other agencies with expertise or jurisdiction as appropriate based on the size of the project and magnitude of emissions.

LEASE NOTICE

Regional Ozone Formation Controls

To mitigate any potential impact oil and gas development emissions may have on regional ozone formation, the following Best Management Practices (BMPs) would be required for any development projects:

- Tier II or better drilling rig engines
- Stationary internal combustion engine standard of 2g NOx/bhp-hr for engines <300HP and 1g NOx/bhp-hr for engines >300HP
- Low bleed or no bleed pneumatic pump valves
- Dehydrator VOC emission controls to +95% efficiency
- Tank VOC emission controls to +95% efficiency

LEASE NOTICE

Air Quality (WDD, CoCD)

All new and replacement internal combustion gas field engines of less than or equal to 300 design-rated horsepower must not emit more than 2 grams of NOx per horsepower-hour. This requirement does not apply to gas field engines of less than or equal to 40 design-rated horsepower. AND All new and replacement internal combustion gas field engines of greater than 300 design rated horsepower must not emit more than 1.0 grams of NOx per horsepower-hour. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.

LEASE NOTICE

Air Quality Analysis

The lessee/operator is given notice that prior to project-specific approval, additional air quality analyses may be required to comply with the National Environmental Policy Act, Federal Land Policy Management Act, and/or other applicable laws and regulations. Analyses may include dispersion modeling and/or photo-chemical modeling for deposition and visibility impacts analysis, control equipment determinations, and/or emission inventory development. These analyses may result in the imposition of additional project-specific air quality control measures.

LEASE NOTICE

Bald Eagle (Formerly T&E-01) (Outside Moab MLP)

The Lessee/Operator is given notice that the lands in this parcel contains nesting/winter roost habitat for the bald eagle. The bald eagle was de-listed in 2007; however, it is still afforded protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c, 1940). Therefore, avoidance or use restrictions may be placed on portions of the lease. Application of appropriate measures will depend on whether the action is temporary or permanent, and whether it occurs within or outside the bald eagle breeding or roosting season. A temporary action is completed prior to the following breeding or roosting season leaving no permanent structures and resulting in no permanent habitat loss. A permanent action continues for more than one breeding or roosting season and/or causes a loss of eagle habitat or displaces eagles through disturbances, i.e. creation of a permanent structure. The following avoidance and minimization measures have been designed to ensure activities carried out on the lease will not lead to the need to consider listing the eagle as threatened or endangered. Integration of, and adherence to the following measures will facilitate review and analysis of any submitted permits under the authority of this lease.
Current avoidance and minimization measures include the following:
1. Surveys will be required prior to operations unless species occupancy and distribution information is complete and available. All Surveys must be conducted by qualified individual(s), and be conducted according to protocol.
2. Lease activities will require monitoring throughout the duration of the project. To ensure desired results are being achieved, minimization measures will be evaluated.
3. Water production will be managed to ensure maintenance or enhancement of riparian habitat.
4. Temporary activities within 1.0 mile of nest sites will not occur during the breeding season of January 1 to August 31, unless the area has been surveyed according to protocol and determined to be unoccupied.
5. Temporary activities within 0.5 miles of winter roost areas, e.g., cottonwood galleries, will not occur during the winter roost season of November 1 to March 31, unless the area has been surveyed according to protocol and determined to be unoccupied.
6. No permanent infrastructure will be placed within 1.0 mile of nest sites.
7. No permanent infrastructure will be placed within 0.5 miles of winter roost areas.
8. Remove big game carrion from within 100 feet of lease roadways occurring within bald eagle foraging range.
9. Avoid loss or disturbance to large cottonwood gallery riparian habitats.
10. Where technically and economically feasible, use directional drilling or multiple wells from the same pad to reduce surface disturbance and eliminate

drilling in suitable habitat Utilize directional drilling to avoid direct impacts to large cottonwood gallery riparian habitats. Ensure that such directional drilling does not intercept or degrade alluvial aquifers.

11. All areas of surface disturbance within riparian areas and/or adjacent uplands should be re-vegetated with native species.

Additional measures may also be employed to avoid or minimize effects to the species between the lease sale stage and lease development stage. These additional measures will be developed and implemented in coordination with the U. S. Fish and Wildlife Service.

LEASE NOTICE

Floodplain Management

The lessee/operator is given notice that, in accordance with Executive Order 11988, to avoid adverse impact to floodplains 1) facilities should be located outside the 100 year floodplain, or 2) would be minimized or mitigated by modification of surface use plans within floodplains present within the lease.

LEASE NOTICE

Pollinators and Pollinator Habitat (Sept 2018 Price-Richfield Lease Sale EA)

In order to protect pollinators and pollinator habitat, in accordance with BLM policy outlined in Instruction Memorandum No. 2016-013, Managing for Pollinators on Public Lands, and Pollinator-Friendly Best Management Practices for Federal Lands (2015), the following avoidance, minimization, and mitigation measures would apply to this parcel:

1. Give a preference for placing well pads in previously disturbed areas, dry areas that do not support forbs, or areas dominated by nonnative grasses.
2. Utilize existing well pads where feasible.
3. Avoid disturbance to native milkweed patches within Monarch migration routes to protect Monarch butterfly habitat.
4. Avoid disturbance of riparian and meadow sites, as well as small depressed areas that may function as water catchments and host nectar-producing species, to protect Monarch butterfly habitat and nectaring sites.
5. Minimize the use of pesticides that negatively impact pollinators.
6. During revegetation treatments:

a. Use minimum till drills where feasible.

b. Include pollinator-friendly site-appropriate native plant seeds or seedlings in seed mixes.

c. Where possible, increase the cover and diversity of essential habitat components for native pollinators by:

□ Using site-appropriate milkweed seeds or seedlings within Monarch migration routes through priority sage-grouse habitat.

□ Using seed mixes with annual and short-lived perennial native forbs that will bloom the first year and provide forage for pollinators.

□ Using seed mixes with a variety of native forb species to ensure different colored and shaped flowers to provide nectar and pollen throughout the growing season for a variety of pollinators.

□ Seeding forbs in separate rows from grasses to avoid competition during establishment.

□ Avoiding seeding non-native forbs and grasses that establish early and out compete slower-growing natives.

LEASE NOTICE

Kit Fox Habitat

The lessee/operator is given notice that no surface disturbances would be allowed within 660 feet (200 meters) of an occupied natal kit fox den.

NSO - NATIONAL REGISTER OF HISTORIC PLACES, CULTURAL RESOURCES (SITES, STRUCTURES, OBJECTS, AND TRADITIONAL USE AREAS) (2008 ROD 2.3.2. NSO STIPS)

Stipulation: In accordance with the No Surface Occupancy Lease Stipulations in Section 2.3.2. of the December 2008 Bureau of Land Management Record of Decision for the Geothermal Leasing Environmental Impact Statement and the suggested mitigating measures, No Surface Occupancy within the boundary of properties designated or eligible for the National Register of Historic Places, including National Landmarks and National Register Districts and Sites, and additional lands outside the designated boundaries to the extent necessary to protect values where the setting and integrity is critical to their designation or eligibility.

Exception: The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource and/or the resource the resource is no longer National Register quality. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated negative impacts. An exception may be granted for actions designed to enhance the long-term utility or availability of the cultural resources.

Modification: The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

On the lands described below:

All Lands

NSO - TRADITIONAL CULTURAL PROPERTIES (2008 ROD 2.3.2. NSO STIPS)

Stipulation: In accordance with the No Surface Occupancy Lease Stipulations in Section 2.3.2. of the December 2008 Bureau of Land Management Record of Decision for the Geothermal Leasing Environmental Impact Statement and the suggested mitigating measures, No Surface Occupancy within areas with important cultural and archaeological resources, such as traditional cultural properties and Native American sacred sites, as identified through consultation.

Exception: None.

Modification: The Authorized Officer may modify the size and shape of the restricted area if through consultation and cultural analysis indicates the traditional cultural properties resource differs or changes.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

On the lands described below:

All Lands

NSO - RIPARIAN HABITAT (2008 ROD 2.3.2. NSO STIPS)

Stipulation: No Surface Occupancy (NSO) on and within riparian-wetland vegetated areas to protect the values and functions of these areas. To protect the values and functions of riparian and wetland areas based on the nature, extent, and value of the area potentially affected.

Exception: The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated negative impacts. An exception may be granted for actions designed to enhance the long-term utility or availability of the riparian habitat.

Modification: The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

On the lands described below:

All Lands

NSO - WATER BODIES, WETLANDS, AND/OR 100-YEAR FLOODPLAINS

Stipulation: No Surface Occupancy (NSO) on water bodies, wetlands and/or 100-year floodplains.

Exception: The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated negative impacts. An exception may be granted for actions designed to enhance the long-term utility or availability of the water bodies, wetlands, and/or 100-year floodplains resource.

Modification: The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

Waiver: The restriction may be waived if it is determined that the described lands do not contain the subject resource or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

On the lands described below:

All Lands

TL - BALD EAGLE WINTER HABITAT

Stipulation: In order to protect important seasonal bald eagle winter habitat, exploration, drilling, and other development activity will be allowed during the period from May 1 through October 31. This imitation does not apply to maintenance and operation of producing wells.
Exception: Exceptions to this imitation in any year may be specifically authorized in writing by the authorized officer of the BLM.
Modification: None
Waiver: None

On the lands described below:

All Lands

APPENDIX C

Bureau of Land Management
Interdisciplinary Team Checklist

Project Title: Fervo Geothermal Production EA
NEPA Log Number: **DOI-BLM-UT-C010-2024-0018-EA**
File/Serial Number:
Project Lead: Ed Ginouves

RESOURCES AND ISSUES CONSIDERED:

Determination	Resource	Rationale for Determination	Name, Position	Date
NI	Air Quality	The principal impacts to air quality during the construction phase of the project would be fugitive dust from vehicle travel on unpaved access roads and exhaust emissions from the diesel-electric generator sets that power the drilling operations. Fugitive dust emissions would be controlled by the regular application of water to the unpaved access road and limiting vehicle speeds. The emissions from the diesel generator sets are minimized by the the diesel engines being Tier 2 compliant and the ongoing replacement of the diesel generators with electricity from the utility grid via temporay power lines. There will be no emissions during the production phase of the project as the geothermal heat recovery utilizes a completely closed loop system.	Ed Ginouves	6/3/2024
NP	Areas of Critical Environmental Concern	There are no ACECs within the CCFO.	Mike Innes	5/29/2024
PI	Cultural Resources	Section 106 of the National Historic Preservation Act (NHPA) will be implemented using a phased approach as outlined in 35CFR800.4(a)(2). Once individual project areas are identified, a cultural resource investigation will be conducted, and the BLM will consult with appropriate Native American tribes and the Utah State Historic Preservation Officer (SHPO). All phases of 106 cultural resource inventory will be completed prior each phase of project implementation. **Areas of Potential Effect (APE):** The BLM has identified two distinct Areas of Potential Effect (APE) for this project: Physical APE: This includes any Project activities that are surface or subsurface disturbing (e.g. development of the power plants, well pads, reserve pits, exclusion fences, access roads, sub-transmission lines, a transmission line, a switch yard, pipelines, drilling, associated facilities and temporary trailers). A Class III intensive pedestrian survey will be conducted within this APE to identify cultural resources. This procedure will follow the State Protocol Agreement Between the BLM and the Utah State Historic Preservation Office standards for inventory and reporting. Visual APE: This encompasses a specified radius around the power plants, switch yard, sub-transmission lines, and transmission line. (Table 1, Appendix A). A GIS viewshed analysis will be used to refine the final boundaries of the Visual APE, areas without potential visibility of the project will be removed from the Visual APE. Cultural resources located within the final Visual APE that fit the criteria outlined in Appendix A Visual Effects Analysis Procedure will be assessed for potential visual effects. BLM will seek information from and view of the following tribes regarding any knowledge of or concerns with historic properties in the APE, as well as, inquire whether the Tribe is aware of any historic properties that may be physically or visually impacted by the proposed project.	Debra McCarthy	6/5/2024
NI	Environmental Justice	Using the BLM Environmental Justice Mapping Tool, the proposed action falls within U.S. Census Bureau ID: 49001002001, Tract 100200, Block Group 1 within Beaver County, Utah. The Block Group (BG) will be the study area with the State of Utah as the reference area. The Low-Income population residing within the identified BG is 23%. This does not meet the 50% threshold and is not greater than or equal to the reference area for low-income population, which is 25%. There is not a Low-Income community of concern present at this time. The Minority population residing within the identified BG is 18%. This does not exceed the 50% threshold. The minority population that does reside in the BG also is not 10% greater than the reference area, which is 23%. There is not a Minority community of concern present at this time within the block group. While there are minority and low-income populations present within the associated BG, the populations do not meet the associated communities of concern thresholds required by Executive Order 12898. Therefore a NI determination is made.	H. Houston	6/3/2024
NP	Farmlands (Prime or Unique)	The Natural Resources Conservation Service (NRCS) Web Soil Surve Tool shows the area has no Prime or Unique Farmlands.	Mitch Bayles	6/6/2024
NP	Floodplains	Project does not occur within a mapped floodplain.	Mike Moulton	5/28/2024
NI	Fuels and Fire	If the procedures and methods are followed as detailed in the plan this project would not impact fire and fuels to require a detailed analysis. The spread of annual grasses or fine fuels at sites disturbed by drilling activities would be a potential problem, but as long as actions are taken to mitigate this then threat of fire ignitions will be greatly reduced.	Martin Esplin	5/31/2024
PI	Geology / Mineral Resources/Energy Production	There are no minerals-related authorizations (leases, mining claims, permits) on the federally-managed lands within the AOI other than the proponent's geothermal leases and lands nominated by the proponent for future geothermal leasing. There is presently no active solid mineral mining activity on the privately-owned lands within the AOI. The known mineral resources within the AOI are geothermal resources in the form of hot dry rock at depth and surficial deposits of common variety sand and gravel. The proposed project intends to extract heat energy from a naturally-occurring resource of hot dry rock and convert that heat energy into electricity for commercial sale. Heat energy that would be extracted to generate electricity would be permanently lost to the resource, resulting in a gradual temperature decline in the reservoir rock that has been stimulated by hydraulic fracturing. See Impact Analysis Worksheet.	Ed Ginouves	5/17/2024
NI	Greenhouse Gas Emissions	Some greenhouse gasses will be emitted from machinery during construction. This action may lead to a successful geothermal project, which may reduce the proportion of energy that is generated from fossil fuels.	Brooklynn Cox	5/31/2024

NI	Invasive Species/Noxious Weeds	There are 2 known acres to exist within the Fervo AOI project area. Invasive species would not be impalcted if stipulations that vehicles and equipment are powerwashed during any kind of construction or disturbance activity and noxious weeds avoided to eliminate the spread of seeds. As well as a stipulation that the applicant is responsible for weed treatment of any current or new noxious weeds within the leased area (ROW), there are 38 weeds that have been designated state noxious and then if an listed by the individual counties, that must be treated if become present. Applicant must submit a Pesticide use proposal to the BLM weed personell of what chemicals and adjuvents that they plan to use for treatment and it needs to be approved. The chemicals and adjuvents has to be on the BLM approved list (see weed personell for list). Applicant must complete a Pesticide use report within 24 hrs of treatment and must provide reports to the CCFO annually. Noxious weed infestations are spread in part the movement of vehicles/equipmnet, humans, animals, including livestock by transport of seed through physical contact and/or ingestion, as well as spread from acts of Mother nature such as: wind and water. The small, isolated noxious weed infestations should eventually be reduced in the future with the continuation of the noxious weed program which was implemented by the Cedar City Field Office (CCFO). The CCFO currently has an aggressive noxious weed control program and annually removes large quantities of noxious weeds throughout BLM administered lands in both Iron and Beaver counties. The BLM coordinates with County, State and Federal agencies in order to locate, treat and monitor noxious weed infestations throughout both counties.	J. Bulloch	6/11/2024
NI	Lands/Access	In the current project area there are multiple rights-of-way (ROW) that are currently authorized. These ROWs consists of power transmission, water facilities, gas piplines, wind power generation, and roads. The following ROW serial numbers are currently authorized in MLRS for the project area. Wind power generation: UTUT105868442 & UTUT106230525. Water facilities: UTUT105856512 & UTUT106235189. Telephone transmission: UTUT106103867. Gas pipeline: UTUT106153564. Roads: UTUT106200746 & UTUT106310585. Power transmission: UTUT106203368, UTUT105855930, UTUT106230547, UTUT105889521, UTUT105919780, UTUT106102612, UTUT106155703, UTUT106235815 & UTUT106235770. Other ROWs: UTUT106235912, UTUT106203565 & UTUT105979009. All current authorized ROW holder will be contacted in writing concerning this project and the possible impact to their ROW. The project area is located northeast of Milford, Beaver County, Utah. Access to the project area will be multiple access roads that are connected via Utah Hwy 257.	L. McConnell	6/5/2024
NP	Lands with Wilderness Characteristics	The project area is not within any LWCs. The Granite Peak LWC unit is approximately 2.5 miles from the project area.	Mike Innes	5/29/2024
NI	Livestock Grazing	The project will occur within the Hanson, Milford Bench & Whitaker Allotments. The livestock grazing season of use is from November 1st - May 15th. A three allotment (Hanson, Milford Bench and Whitaker) grazing management system has been identified to limit critical growing period use to two out of three years within each allotment. If the project is constructed outside the season of use, there would be no impacts to livestock grazing. If the project is implemented during the season of use, livestock may be disturbed by construction equipment. Range improvement projects including fences, water pipelines and cattle guards that would be impacted would be replaced or restored. It is expected that livestock fences could be cut to allow ingress/egress of construction equipment; fence reconstruction would be required immediately following the completion of the project. In addition, any disturbed areas within the project area would be reclaimed utilizing a BLM approved seed mix. Livestock Design Features will be added to mitigate potential impacts: 1) Any potential hazards to livestock should be fenced to prevent loss of life or injury to livestock. 2) If any rangeland improvement projects are impacted, they would be repaired as soon as possible and/or reconstructed following the completion of the project. 3) Any disturbed areas within the project area that are not associated with viable wells, roads or facilities would be reclaimed utilizing a BLM approved seed mix. 4) Dust control measures would be employed to reduce impacts to livestock forage during construction. 5) Best to avoid construction during the livestock grazing season of use. If un-avoidable the BLM needs to be contacted to notify livestock permittees 30-days prior to construction. Contractor will be responsible to keep cattle within the correct pastures and allotments during construction and prevent harm to livestock.	Mitch Bayles	5/31/2024
NP	National Historic Trails	There are no National Historic Trails within the project area.	Mike Innes	5/29/2024
PI	Native American Concerns	A Plan of Action must be developed for inadvertent discovery of Native American human remains and funerary items to comply with the NAGPRA in consultation with appropriate federally recognized Tribes. An invitation to tribes will be sent to engage in a Government-to-Government capacity. Tribes will also be consulted to determine if there are any areas of traditional religious and/or cultural importance that may be affected by this project. **Additional Information:** See Impact Analysis Worksheet for further details and project design features, Cultural Resources Appendix A. APE & VEA Procedures for the Area of Potential Effect definitions and the visual effect assessment procedures, and Cultural Resources Appendix B. Obsidian Source Concentration Documentation and Contributing Elements Methodology for the definitions and methodologies related to recordation of cultural resources within 42BE52, 42BE88, and areas nearby that might be considered an expansion of these sites. See Cultural Resources Appendix C. Project Design Features for detailed project design features.	Debra McCarthy	6/5/2024

NI	Paleontology	The surficial geology of the AOI is a combination of Quaternary-age fluvial and lacustrine deposits of gravel, sand, silt and clay. Using the Bureau's Potential Fossil Yield System, the fluvial deposits would fall within Class 1, Very Low Potential, and the Lacustrine deposits, in part, Class 3b, Unknown Potential for recognizable fossil resources. No paleontological resources are known to exist within the AOI, however the maximal shoreline of ancestral Lake Bonneville roughly bisects (north to south) the Phase 1 and Phase 2 proposed action area of the AOI. Ancestral Lake Bonneville was a Pleistocene-aged lake with known occurrences of mega-fauna vertebrate fossil skeletons adjacent to the lakeshore. The nearest known vertebrate fossil occurrence of this type to the project area was discovered in 2010 during the excavation of wind turbine foundation WGT 7-21 in Phase 2 of the Milford Flat Wind Farm. This locality lies within the SE¼ sec. 3, T. 26 S., R. 10 W. , this being outside of the AOI and roughly five miles to the northwest of the center of the proposed project disturbances. The fossil find was a partial camel skeleton at a depth of 6 feet. It is conceivable that Pleistocene-age fossil skeletons are present at some depth under portions of the AOI and the areas currently proposed for disturbance within the AOI. There is no way to predict where these might occur in advance. The most likely chance for a fossil discovery to be made would be in the excavation of reserve pits on the well pads, as these are the deepest excavations proposed for the project. The inadvertant destruction of fossil resources on the federal portions of the project could be mitigated by the inclusion of a stipulation to halt excavation of reserve pits should fossil resources be uncovered through excavation and the fossil find propoerly excavated and recorded.	Ed Ginouves	5/17/2024
NI	Rangeland Health Standards	The project has the potential to impact to the Standards of Rangeland Health that have been considered on the two impacted grazing allotments. Standards that could have significant impacts if the correct mitigation actions don't take place include: Standard 1 - Upland soils exhibit permeability and infiltration rates that sustain or improve site productivity, considering the soil type, climate and landform. Standard 3 - Desired species, including native, threatened, endangered, and special status species are maintained at a level appropriate for the site and species involved. However the proposed project has the potential of 148 acres of new disturbance which is only .68% of the total acres of both grazing allotments. If the design features for Soils, Vegetation and Livestock Grazing are followed current RLH standards would not be impacted.	Mitch Bayles	5/31/2024
NI	Recreation	There are no developed recreation sites within the project area. Dispersed recreation use levels are low in this area and will not be impacted due to the similar dispersed opportunities available surrounding the project area.	Mike Innes	5/29/2024
NI	Socio-Economics	The scale of the proposed project suggests that it could have short and long term positive impacts to the economy of Beaver County, however a detailed study carried out in the post (see Uneven Local Benefits of Renewable Energy in the U.S. West: Property Tax Policy Effects, Haggerty et al., Western Economics Forum, Spring 2014: Volume 13, Number 1) clearly demonstrated that the tax benefits to the local economy were strongly linked to the county's millage rate for developments of this type. Counties with very low millage rates, such as Beaver County, had minor increases to their property tax revenue despite large capital expenditures. The size and significance of these impacts can only be roughly estimated in advance, but for the present proposal, will likely amount to less than 5% of county revenue and 2% or less for long-term in county employment. Short-term local employment increases during project construction are likely to be minor as the majority of the necessary workers are brought in from out of county to carry out the well-field development and power-plant construction. The large capital improvements being made on privately-owned land will increase the property valuation, but the low millage rate for these improvements in Beaver County and their declining valuation over time means these will not significantly increase the county's overall property tax revenue. Geothermal energy production from the federal portions of the project will return 25% of that royalty revenue to the county. The amount of that royalty revenue will depend on the price of the produced electricity and the fraction of the geothermal energy attributed to the federal leases.	Ed Ginouves	5/30/2024
PI	Soils	Further analysis on soils will be needed. Mitigation measures will be implemented. However some direct impacts to soils could include changes to soil function due to soil exposure from removal of vegetation. Mixing of the soil horizons, potential loss of top soil productivity, soil compaction and increased susceptibility to wind and water erosion.	Mitch Bayles	5/31/2024
NI	Special Status Plants	Ute's- ladies'-tresses orchid is a USFWS threatened status species that showed up on the IPaC report generated for this project area. However, the project area has no habitat potential present that would be assosiated with the habitat characteristics associated with this species. No Special Status plant species are known to occur within the project area and have low potential to be present.	Mitch Bayles	5/31/2024
PI	Vegetation	Surface stabilization and reclamation is included in the Plan of Operations to mitigate the loss of vegetation. However further analysis may be needed to prevent the loss of crucial areas of forage for wildlife and livestock grazing. Since reclamation procedures are not always successful due to factors such as disturbed soils and climatic conditions.	Mitch Bayles	5/31/2024
NI	Visual Resources	The proposed project area is within VRM Class IV. VRM Class IV allows for managment activities that require major modification of the existing character of the landscape. Class IV Objective states that management activities may dominate the view and be the major focus of viewer attention. The proposed action would meet VRM Class IV objectives.	Mike Innes	5/29/2024
NP	Wastes (hazardous or solid)	There are no known waste issues currently associated with the proposed project area. Use of construction equipment introduces a threat only if an unforeseen incident or malfunction occurs with the equipment. However, this threat is unlikely due to the probability and minimal quantities of product utilized. State and federal regulation governs the use, storage and disposal of any wastes. In addition, should an unforeseen incident occur, reporting and mitigation is required.	Travis Carlson	5/29/2024
NI	Water Resources/Quality (drinking/surface/ground)	No surface water resources occur within project area. One Lentic, and one Lotic site are adjacent to project area but no impacts are expected to occur because they are well outside of project area. Mitigation measures for stormwater, erosion, and hazardous fluids detailed in 5.2 and 5.3 of the plan of operations are sufficient to mitigate any potential impacts to these areas. Within the project area there may be ephemeral washes that see moisture seasonally. 100 foot setbacks should be implemented along ephemeral washes. In areas where this is not reasonably feasible, a site specific storm water pollution protection plan for each well pad should be developed.	Mike Moulton	9/23/2024
NP	Wetlands/Riparian Zones	No riparian areas identified within project area. LO1098 (Ranch Canyon Creek) and LE1087 (Negro Mag Hot Spring) are located adjacent to project area. **Design features** outlined in 5.2 and 5.3 of the Plan of Operations are sufficient to mitigate impacts to these areas.	Mike Moulton	9/23/2024
NP	Wild and Scenic Rivers	There are no Wild and Scenic Rivers within the CCFO.	Mike Innes	5/29/2024
NP	Wilderness/WSA	Wilderness Study Areas will not be impacted. The closest WSA is approximately 30 miles from the project area.	Mike Innes	5/29/2024
NP	Wild Horses	The proposed project is not within or adjacent to any wild horse Herd Areas (HA) or Herd Management Areas (HMA).	Brooklynn Cox	5/31/2024

PI	Wildlife & Fish	Project is within year-long pronghorn habitat. Portions of the AOI are within mule deer winter range. Detailed analysis is required for impacts to big game habitat/movement corridors in relation to Secretarial Order 3362. Design features should include avoiding surface disturbance May 1 to June 30 to minimize impacts to fawning pronghorn. Recommend strategy to design mitigation or habitat treatments to offset impacts from this project.	Dustin Schaible	5/28/2024
NP	Wildlife - Greater Sage-Grouse	Project is not within sage grouse habitat.	Kade Willardson	6/4/2024
PI	Wildlife – Migratory Birds	Various migratory bird species including raptors occupy the proposed project area / area of interest. Detailed analysis would be needed to anaylze and disclose impacts and cumulative impacts to migratory bird populations in the area from short-term and long-term project disturbance. During initial project development, avoid construction of geothermal project areas during migratory bird nesting season, January 1 - August 31, to the greatest extent possible. If this is not possible, then avoid any habitat alteration, removal, or destruction during the primary nesting season for migratory birds, March 1 - July 31. If project development must occur during the primary nesting season for migratory birds, then nest surveys would be required by certified wildlife biologist(s) and timing restrictions and spatial buffers would be applied until nests are no longer active. At least a 100 ft buffer would be applied to passerine species nests and 0.25 - 1.00 mile for raptor nests depending on species (see Romin and Muck, 2002). Powerlines would adhere to APLIC (2006) guidlines.	Derek Christensen	5/31/2024
PI	Wildlife-Special Status (not TEC)	Project is within habtiat that may be occupied by the following sensitive species (bald eagle, burrowing owl, dark kangaroo mouse, ferruginous hawk, long-billed curlew, kit fox, pygmy rabbit, short-eared owl, spotted bat and townsend's big-eared bat). Design features should include general BMPs for bird species captured under the migratory bird section and include specific protocols for burrowing owl and long-billed curlew. Clearance surveys and BMPs would also be required for pygmy rabbit following Ulmschneider 2004 and for kit fox following the Fillmore Field Office protocol to minimize direct impacts to these species. Cumulative impacts to kit fox habitat in Milford Valley would require detailed analysis. Recommend strategy to design mitigation or habitat treatments to offset impacts from this project.	Dustin Schaible	5/28/2024
NI	Wildlife - T&E and Candidate	According to USFWS Information for Planning and Consultation (IPaC), there are two T&E and candidate species that have potential to occur in the area of interest. These species include yellow-billed cuckoo (threatened) and monarch butterfly (candidate). However, there would be no impact to the yellow-billed cuckoo from the proposed geothermal power project because the area of interest has no suitable habitat. Monarch butterfly could occupy the area of interest for foraging, migrating, and breeding (if milkweed species are present). The proposed geothermal power project would not jeopordize the monarch butterfly if applicable conservation recommendations are applied from Western Monarch Butterfly Conservation Recommendations (USFWS, 2023).	Derek Christensen	5/31/2024
NP	Woodland / Forestry	Woodland/Forestry resources are not present in proposed project area.	Colby Peterson, Forester	5/22/2024

APPENDIX D

Design Features and Lease Stipulations

CAPE GEOTHERMAL POWER PROJECT

DESIGN FEATURES

Air

1. A speed limit of 25 miles per hour would be observed on unpaved roads in the project area to limit fugitive dust.
2. Water would be applied to the ground during construction as necessary to control fugitive dust.
3. In addition to water being utilized to control fugitive dust, other dust mitigation or abatement strategies should be employed such as magnesium chloride treatments of roads or other surface treatments to minimize the distribution of fugitive dust across the landscape and into the air. Prior to utilization of new dust abatement applications not described above, the applicant would need a notice to proceed to ensure that no undue degradation of public land would occur or be impacted to a degree outside of that described in the EA.
4. Soil stockpiles that are to be stored for more than 6 months would be stabilized with vegetative cover.
5. All internal combustion equipment would be kept in good working order.
6. Open burning of garbage or refuse would not occur at well sites or other facilities.
7. Drill rigs would be equipped with Tier II or better diesel engines.
8. Stationary internal combustion engines would comply with the following standards: 2g NOx/bhp-hr. for engines less than 300 horsepower, and 1g NOx/bhp-hr. for engines greater than 300 horsepower.
9. No natural gas flaring, natural gas stock tanks, or triethylene glycol (TEG) dehydrators would be required during completion.
10. Low bleed or no bleed pneumatics would be installed on separator dump valves or other controllers.
11. Well-site telemetry would be utilized, as feasible, for production operations.
12. Any fixed generators will be permitted as required by state and local regulation through UDAQ and Beaver County.

Soil and Vegetation

1. Construction for the exploration activities associated with proposed project has been authorized by the UDWQ under UPDES Permit Number UTRC08093. The SWPPP was approved by UDWQ and has been implemented for the existing exploration activities associated with the proposed

project. A SWPPP amendment or an additional SWPPP would be prepared and NOI submitted to obtain authorization from UDWQ for stormwater discharges associated with the proposed production project.

2. Where feasible, multiple wells would be drilled on a single pad to reduce surface disturbance impacts.
3. All surface disturbing activities would progress incrementally, with well pads, ancillary facilities, and access roads constructed individually or in groups of two or three, rather than all well pads and access roads constructed at one time. Well sites, and associated access roads, deemed by the operator to be commercially non-viable would be reclaimed as the project progresses to reduce the cumulative acreage of surface disturbance at any given time.
4. An established local aggregate producer would be utilized to limit additional surface disturbance.
5. Prior to utilization of well drill cuttings for construction of roads, facilities, pads or other surface disturbances, each reserve pit would be required to be tested and a report must be submitted to the BLM Geologist for approval. The tests to be performed include Toxicity Characteristic Leaching Procedure (United States Environmental Protection Agency [EPA] Method 1311), tests for heavy metals (EPA method 6010); pH (EPA method 9045D); Total Petroleum Hydrocarbons/Diesel (EPA Method 8015B); and Oil and Grease (EPA Method 413.1). Heavy Metals or other hazardous or toxic materials would not be allowed to be utilized and would instead follow The Gold Book (BLM 2007) guidelines regarding reserve pit reclamation.
6. A speed limit of 25 miles per hour would be observed on unpaved roads in the project area to limit fugitive dust.
7. Topsoil would be stripped (typically to the rooting depth) and salvaged during the construction of all pads, as feasible. Salvaged topsoil (and cleared organic material, stumps, brush, and slash, if saved) would be stockpiled on the pads for use during subsequent reclamation of the disturbed areas.
8. Soil stockpiles that are to be stored for more than 6 months would be stabilized with vegetative cover.
9. Following construction, any disturbed areas within the project area no longer required for operations (shoulders of well pads, laydown yards, staging areas, etc.) would be reclaimed utilizing a BLM-approved seed mix.
10. Disturbed areas within ROWs would be stabilized by reestablishing vegetative cover, using a BLM-approved seed mix, to reduce soil erosion.
11. Parameters for limiting public access along the survey lines following completion of the project would reduce the number of new roads within the area. Common parameters include berming and

blocking off access roads when not in use and texturing reclaimed areas to discourage driving and prevent additional use of area by the general public.

12. All vehicles, earth-moving construction equipment, mobile trailers, and RV campers would be power-washed prior to arriving in the project area to limit the potential for the introduction of invasive species / noxious weeds.
13. If noxious weeds are discovered, these areas would be avoided to limit the spread of noxious weeds. The proponent would be responsible for noxious weed treatment (using certified chemicals) necessary in the disturbed portions of the project area and for reporting to the BLM's noxious weed coordinator.

Water Resources

1. Construction for the exploration activities associated with proposed project has been authorized by the UDWQ under UPDES Permit Number UTRC08093. The SWPPP was approved by UDWQ and has been implemented for the existing exploration activities associated with the proposed project. A SWPPP amendment or an additional SWPPP would be prepared, and NOI submitted to obtain authorization from UDWQ for stormwater discharges associated with the proposed production project.
2. Erosion and Sediment Control Measures would be implemented as necessary, and as specified in the SWPPP, including "drainage bars, check dams and berms."
3. Any impacts to utilizing water rights through the project would be analyzed by UDWRi in the analysis of the geothermal well in accordance with applicable state regulations.
4. The project site would be graded to limit the movement of stormwater from well pad construction areas off site, and reserve pits would be designed for a 100-year storm event.
5. Each drill pad would be graded towards the reserve pit to limit movement of stormwater runoff from the pad.
6. Stormwater 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 stormwater.
7. Disturbed areas that are no longer being used would be reclaimed as soon as possible to limit stormwater runoff.
8. Geothermal wells would be cased to prevent co-mingling of the geothermal fluids with underground aquifers. Well casing would meet all requirements outlined in Geothermal Resources Operational Order No. 2 (DOI Geological Survey Conservation Division 1975), or Onshore Oil and Gas order No. 2 (BLM 1988), with consent and approval from the BLM and UDWRi.

9. With the exception of fluids discharged to the reserve pit during flow testing, no geothermal fluids would be discharged to the ground.
10. All petroleum products on-site would be labeled, stored, and handled in conformance with applicable federal, state, and manufacturer requirements. Spill contingency plans are detailed in the Plan of Operations (**Appendix A**).
11. Water brought out of the wells would be periodically tested for radioactivity. There are currently no known sources of Naturally Occurring Radioactive Materials (NORMs) in the Project Area, however, should NORMs be discovered, the BLM will need to be notified immediately.
12. 100 ft setbacks from ephemeral washes shall be implemented where feasible. Where not feasible, a site specific SWPPP will need to be developed and implemented.

Wildlife / Livestock

1. Any potential hazards to livestock would be fenced to prevent loss of life or injury to livestock.
2. If construction occurs during the livestock season of use (November 1 - May 15), the BLM would be contacted to notify livestock permittees 30-days prior to any surface disturbing activities.
3. Eight-foot exclosure fencing around reserve pits, power plants, and the switchyard would be utilized to prevent access by persons, wildlife, or livestock. Exclosure fencing would consist of chain-link fence or other BLM-approved fencing recommendations.
4. To prevent livestock, wildlife, and persons from becoming entrapped, one side of the reserve pit walls would be sloped at an approximate 30 percent incline.
5. Facilities and above ground structures should be designed in a way that it will not restrict livestock movement or block off large areas within the allotment that could otherwise be used for grazing.
6. To prevent accidental entrapment of kit fox or other animals during construction, all excavated holes or trenches greater than 2 feet deep shall be covered at the end of each workday by suitable materials, fenced, or escape routes constructed of earthen materials or wooden planks shall be provided. Before filling, such holes shall be thoroughly inspected for trapped animals.
7. Where non-exclosure fencing is necessary, EDR would use fencing consistent with the UDWR-recommended specifications for wildlife to be compatible with big game species (Autenrieth et al. 2006).
8. Contractor(s) would be responsible to keep cattle within the correct pastures and allotments during construction and prevent harm to livestock.
9. Equipment would be inspected prior to operation to ensure no wildlife are located in or near the equipment.

10. If big game species enter the immediate work area during construction, work would stop until the big game species have exited the work area.
11. EDR will cooperate directly with UDWR to contribute to a water development project and shrub enhancement project within the Milford Valley area to mitigate for potential impacts to pronghorn and other big game species that may utilize the project area.
12. If any rangeland improvement projects are impacted, they would be repaired as soon as possible and/or reconstructed following the completion of the project.
13. If any rangeland improvement projects (pipelines, cattle guards, troughs, fences, etc.) are impacted by new facilities and are no longer functional the BLM will be notified, and the permittee will be reimbursed for any investments/contributions associated with the improvement.
14. Any disturbed areas within the project area that are not associated with viable wells, roads, or facilities would be reclaimed utilizing a BLM-approved seed mix.
15. Dust control measures would be employed to reduce impacts on wildlife / livestock forage during construction.
16. A speed limit of 25 miles per hour would be observed on unpaved roads in the project area to avoid collisions with wildlife / livestock.
17. Existing roads would be utilized, where possible, to limit surface disturbance from constructing new roads.
18. No off-road travel or ground disturbing activity would be allowed from May 1 through June 30 within identified crucial pronghorn fawning habitat.
19. In order to protect the crucial deer winter range, surface disturbance activities would only be allowed during the period of May 1 through December 30 in identified crucial winter habitat. This limitation does not apply to the maintenance and operation of producing wells.
20. No surface disturbance would occur within 0.25-mile of an occupied kit fox burrow, and disturbance in occupied kit fox habitat would be avoided from February 1 through July 30 to protect breeding pairs, natal dens, neonates, and dispersing individuals. If surface disturbing activities would occur during the pup-rearing season, a presence-absence survey(s), as per the Fillmore Field Office protocol, would be conducted to minimize impacts to kit fox. Remote cameras may be used on potential burrows/dens on federal land identified in the presence-absence survey in advance of construction to evaluate their use – potential burrows/dens which show no kit fox activity would be considered un-occupied.
21. Open and unused pipes, culverts, and similar project features greater than 4 inches in diameter and stored in unfenced areas on ground-level would be inspected and, if possible, capped or

otherwise blocked during construction and installation phases and/or at the end of the workday to avoid trapping, injuring, or killing kit fox.

22. No overnight surface disturbance activities would take place within Very Good/Good value habitat during the time period when kit fox activity is most likely to occur, 1 hour before sunset to 1 hour after sunrise during February 1 to July 30 to reduce impacts during breeding. Nighttime vehicle traffic shall be kept to a minimum on non-maintained roads.

Migratory Birds

1. Project activities would be conducted outside of migratory bird nesting season (January 1 – August 31) to the greatest extent possible.

    a. If not possible then avoid any habitat alteration, removal, or destruction during the primary nesting season for non-raptor migratory birds (March 1 - July 31). If project activities are unavoidable during this time frame, nesting surveys for migratory birds would be conducted by a qualified biologist to ensure no active nests are impacted. Any active nests found would be given appropriate spatial buffers and seasonal timing restrictions. Non-raptor species would be given a minimum of a 100-foot buffer.

    b. If not possible then avoid any habitat alteration, removal, or destruction during the primary nesting season for raptor migratory birds (January 1 – August 31). If project activities are unavoidable during this time frame, nesting surveys for raptor species would be conducted within suitable raptor nesting habitats by a qualified biologist to ensure no active nests are impacted. Any active nests found would be given appropriate spatial buffers and seasonal timing restrictions.

2. Migratory bird nest surveys would be completed 72 hours prior to any disturbance activities.
3. If active nests are identified, biological monitors would continue to monitor active nests until it has been determined by the BLM-authorized officer that the nest is no longer active and buffers could be lifted.
4. Nests with eggs or young cannot be moved until young are no longer dependent on the nest. Confirmation that all young have fledged would be made by a qualified biologist.
5. The BLM would be contacted prior to any maintenance activities that may cause ground disturbance within the primary nesting season, with the possible exception of emergency maintenance.
6. Any raptor nest found in proximity to an area targeted for new disturbance would be protected and managed according to Utah Field Office Guidelines for Raptor Protection from Human and

Land Use Disturbances (Romin and Muck 2002). Raptor nests would be protected through incorporation of spatial and seasonal buffers.

7. Appropriate steps to prevent migratory birds from establishing nests in the potential impact area may be taken including covering equipment that may be stationary and could provide a nesting structure for a bird and covering or excluding birds from any supplies (i.e. pipes) where birds may nest.
8. On-lease transmission and overhead sub-transmission lines would be constructed per Avian Power Line Interaction Committee (APLIC) recommendations to minimize electrocutions and collisions.
9. Off-Lease transmission line would be constructed per APLIC recommendations to minimize electrocutions and collisions. Prior to the issuance of the off-lease right-of-way grant, an Avian Protection Plan (APP) would be required to be approved by a BLM biologist. Once approved, a notice to proceed would be issued for the construction of the transmission line.
10. Guyed structures would be equipped with avian/bat diverters at sufficient intervals to minimize the potential for impacts associated with bird/bat strikes.
11. Perch deterrents would be utilized to reduce avian predation and must be approved by the Authorized Officer.

Cultural Resources and Native American Concerns

1. A Class III Cultural Resource Survey has been conducted on the exploration project area. In consultation with BLM and with SHPO concurrence, any areas containing eligible and unevaluated cultural sites would be avoided, or the potential for impacts mitigated in a manner acceptable to the BLM.
2. A Class III Cultural Resource Survey has been conducted on the majority of the production project area. In consultation with BLM and with SHPO concurrence, any areas containing eligible and unevaluated cultural sites would be avoided, or the potential for impacts mitigated in a manner acceptable to the BLM. Section 106 of the National Historic Preservation Act (NHPA) will be implemented using a phased approach as outlined in 35CFR800.4(a)(2). For areas that have not yet been surveyed, once individual project areas are identified and planned for construction, a cultural resource investigation will be conducted, and the BLM would consult with appropriate Native American tribes and the Utah State Historic Preservation Officer (SHPO). No ground disturbing activities would take place until concurrence from SHPO on any future cultural resource surveys is received.

3. Due to the high presence of lithic scatters and a large lithic landscape overlapping the proposed project, resources will be evaluated following methodology previously developed by Montgomery Archaeological Consultants (MOAC) in 2022 (*Proposed Methodology for the Documentation and Assessment of Lithic Concentrations Associated with 42BE52/42BE88, Beaver County, Uta*h; associated with survey project U22MQ0069).
4. In situations where construction would be immediately adjacent to eligible sites, fencing and/or construction site monitors would be utilized to ensure complete avoidance of eligible contributing concentrations of cultural resources.
5. For areas where an existing road traverses a contributing concentration, all vehicle traffic would remain within the confines of the existing access road.
6. Avoidance of historic properties is the preferred method to address potential adverse effects, and the BLM will require avoidance to the maximum extent practicable. In the event that the project would adversely affect historic property, a Memoranda of Agreement (MOA) would be executed to specify minimization and/or mitigation measures.
7. If an area is identified as having a high potential for subsurface cultural resources, a professionally qualified cultural resources specialist would monitor ground-disturbing activities during project construction, and to complete a report when the activities are finished.
8. Should an unexpected discovery of cultural resources occur during the implementation of ground disturbing activities (such as drilling, digging reserve pits, or installation of infrastructure), all activities would cease within a 100-foot buffer around the resource, as permitted by safety, and the CCFO Archaeologist and the Western Utah Renewable Energy Archaeologist would be notified. The Archaeologists would notify the Utah SHPO and appropriate THPOs or Native American Tribes with an assessment of National Register eligibility of the cultural resource and proposed actions to resolve any adverse effects.
9. EDR would provide cultural resources training for project personnel responsible for excavation regarding the laws protecting cultural resources, appropriate conduct in the field (such as procedures for the inadvertent discovery of human remains), and other project-specific issues. When government-to-government consultation identifies the need and the possibility, Tribes would be invited to participate in or contribute to relevant sessions.
10. A visual effects assessment (VEA) would be conducted following the procedures outlined in the BLM Visual Effects Assessment Procedures. Cultural resources located within the final Visual APE that fit the criteria would be assessed for potential visual effects.
11. In the event of unanticipated discovery of Native American human remains, funerary objects, sacred objects, or objects of cultural patrimony during the implementation of ground disturbing

(such as drilling, digging reserve pits, or installation of infrastructure), the provisions of NAGPRA would apply. A NAGPRA Plan of Action (POA) has been finalized and approved by relevant THPOs; all provisions of the POA would be followed.

Paleontology

1. As the project areas straddles the maximal shoreline of ancestral Lake Bonneville, the possibility exists for Pleistocene-aged megafauna fossils within the project area. If fossil resources are inadvertently exposed through project excavation activity on BLM-managed lands, the Cedar City Field Office will be immediately notified and the excavation work at the location will be temporarily suspended until the fossil find can be evaluated and recorded.

Geothermal Heat

1. The well field design would target a flow rate and temperature that acknowledges the limitations of the developed heat reservoir and the design parameters of the power plant.
2. A heat removal rate would be established that would sustain and maximize economically useful heat production over the projected life of the project.

Visual Resources

1. Where appropriate, fixed structures and fixed equipment on federal property would use appropriately colored materials, stains, or coatings in an effort to blend with the project area's visual backdrop. The BLM's Standard Environmental Color Tool Entire Set (PC01) will be consulted when choosing structure and equipment colors.
2. Where practical and economically feasible, sub-transmission powerlines and flow lines in or adjacent to access roads may be buried.
3. Facility placement on steep slopes, ridgetops, and hilltops or in higher elevation areas would be avoided.

Noise and Lighting

1. Noise and lighting will be minimized and conform to professional standards and jurisdictional regulatory requirements.
2. Detailed facility designs would include a lighting and noise study on the final power plant configuration.
3. Ambient overnight lighting would be minimized to only areas required for safe operations or regulatory requirements. Where necessary, ambient lighting would be designed to cause minimal light outside the operating area.

4. BLM regulations mandate that noise at one-half mile—or at the lease boundary, if closer—from a major geothermal operation shall not exceed 65 A-weighted decibels (43 CFR 3200.4[b]).

5. To abate noise pollution, mufflers would be used on all drilling rig engines. Where compressed air drilling methods are utilized, rock mufflers could be used to attenuate noise produced from steam venting.
6. All equipment will have sound-control devices no less effective than those provided on the original equipment.

General

1. Trash, junk, waste, and other materials not in current use would be removed. Burial of trash on-site would not be permitted.
2. All construction and operating equipment would be equipped with applicable exhaust spark arresters.
3. Fire extinguishers would be available on the active sites.
4. Water that is used for construction and dust control would be available for firefighting.
5. Personnel would be allowed to smoke only in designated areas.
6. No pets would be allowed in the project area.
7. A health and safety program will be developed to protect both workers and the general public during construction and operation of geothermal projects.
8. OSHA safety standards will be followed during all construction and assembly periods.
9. The project area is located outside of residential areas and would not likely cause hazards to public health and safety.
10. The disturbance occurring in the project area is not expected to affect fuels treatments other than appropriate buffers would be applied by the BLM to protect surface and sub-surface improvements.

APPENDIX E

Agency Consultation Letters and Responses

Notice Criteria Tool

Notice Criteria Tool - Desk Reference Guide V_2018.2.0

The requirements for filing with the Federal Aviation Administration for proposed structures vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc. For more details, please reference CFR Title 14 Part 77.9.

You must file with the FAA at least 45 days prior to construction if:

- your structure will exceed 200ft above ground level
- your structure will be in proximity to an airport and will exceed the slope ratio
- your structure involves construction of a traverseway (i.e. highway, railroad, waterway etc...) and once adjusted upward with the appropriate vertical distance would exceed a standard of 77.9(a) or (b)
- your structure will emit frequencies, and does not meet the conditions of the FAA Co-location Policy
- your structure will be in an instrument approach area and might exceed part 77 Subpart C
- your proposed structure will be in proximity to a navigation facility and may impact the assurance of navigation signal reception
- your structure will be on an airport or heliport
- filing has been requested by the FAA

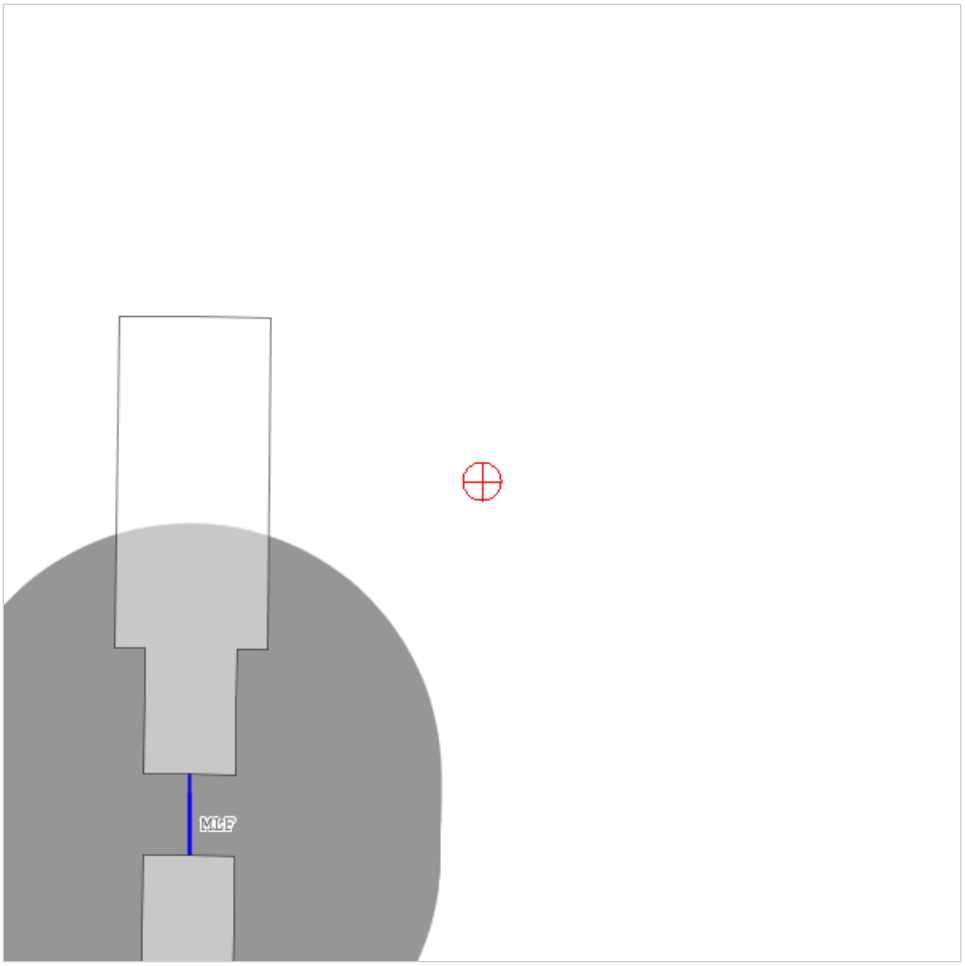
If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport construction.

The tool below will assist in applying Part 77 Notice Criteria.

* **Structure Type:**	RIG | Drilling Rig Please select structure type and complete location point information.
Latitude:	38 Deg 30 M 4.87 S N
Longitude:	112 Deg 55 M 54.44 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	5100 (nearest foot)
Structure Height :	170 (nearest foot)
Is structure on airport:	(●) No ( ) Yes

Results

You do not exceed Notice Criteria.


MLP

Madison Peters

From: Kyle Blackner <kblackner@beaver.utah.gov>
Sent: Thursday, May 16, 2024 11:16 AM
To: Madison Peters
Subject: Re: Proposed Geothermal Power Project in Beaver County

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Madison,

It looks like all the heights will meet the local requirements and will also be outside of the Airport Overlay Height Protection Zone. You should be good to move forward.

Let me know if you have any questions.

Regards,

Kyle Blackner
Building Official
Zoning Administrator
Beaver County
Office: 435.438.6483
kblackner@beaver.utah.gov

beaver.utah.gov

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On Mon, May 13, 2024 at 3:52 PM Madison Peters <mpeters@gesonline.com> wrote:

> Hi Kyle,
>
> We corresponded about a proposed geothermal exploration project in Milford valley a couple years back and if the exploration drill rigs would pose a concern to the Milford municipal airport. The project has been successful and is

moving toward production which will involved more permanent production well rigs and the installation of an aboveground transmission line. We were outside the transition zone for the exploration area but would like to make sure the production area is clear as well! I've received the following height details:

- H&P well drilling rig = 169 ft max to the top of the crown
- Transmission pole construction crane = not yet designed but likely 120 ft to 150 ft, not-to-exceed 200 ft
- Well completion workover rig = 115 ft

Coordinates for existing centrally located well pad: 38°30'38.60"N, 112°54'57.75"W

I am attaching a KMZ of the area of interest for the proposed project. The final production footprint is still in development but will be somewhere within the attached AOI. We would like to get a jump any potential height restrictions ahead of time! Everything will be below the height of the nearby wind turbines.

Can you take look at the attached and let me know if there will be any height restrictions for the proposed production project? Nothing will exceed 200 ft. above ground surface.

Let me know if there is any other information I can provide!

Madison Peters, WPIT

Project Environmental Scientist

Office: 800.871.6417, Ext. 3403

Cell: 817-718-6642
mpeters@GESonline.com

Groundwater & Environmental Services, Inc.

810 Office Park Circle, Suite 113

Lewisville, TX 75057

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Madison Peters

From: Charles Williamson <charleswilliamson@utah.gov>
Sent: Tuesday, May 7, 2024 8:47 AM
To: Madison Peters
Cc: DNR Wrt General Correspondence
Subject: Re: Stream Permitting Question for AOI in Beaver County

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Hi Madison:

Thank you for sending me the aerials and KMZ. It looks like the only potential jurisdictional channel within the project boundaries is Negro Mag Wash. We have processed applications for Ranch Canyon, but that looks like it falls south of the project boundaries. I am not seeing much or any riparian vegetation from the aerials on Negro Mag Wash. As such, it doesn't appear to meet the State Engineer's definition of a natural stream and stream alteration permitting will not be required. Please let me know if you have any questions or require further information.

On Mon, May 6, 2024 at 4:58 PM Madison Peters <mpeters@gesonline.com> wrote:

> Hello Chuck,
>
> You assisted me in reviewing an AOI for a proposed geothermal exploration project in Beaver County a few years back. We have since submitted an EA to the BLM that has been approved and the project has moved to construction and confirmed a viable geothermal resource. Our client is now looking to move the project to production. This will involve expanding the project footprint and a new EA submittal to the BLM. They are currently working on refining their project footprint, and similar to last time, are interested in minimizing impacts to jurisdictional waters, where feasible. Would you be able to take a look at the attached AOI and let me know if there are any waters that may require permitting for impacts through the stream bed alteration program? I am also attaching a few figures that shows where we intersected streams during our field assessment. We did not complete a field assessment of the entire AOI, just some higher priority areas within the AOI. The large majority of streams identified were ephemeral, but we did see some larger streams with riparian areas including Negro Mag Wash.
>
> Please feel free to call me if you have questions or need any additional information in order to review the AOI. The attached files are confidential for the time being. Once the footprint is finalized, we will move forward with the submittal to the BLM. For reference, the last EA is located here: https://eplanning.blm.gov/eplanning-ui/project/2021749/510.
>
> Thank you for your input!

Madison Peters, WPIT

Project Environmental Scientist

Office: 800.871.6417, Ext. 3403

Cell: 817-718-6642
mpeters@GESonline.com

Groundwater & Environmental Services, Inc.

810 Office Park Circle, Suite 113

Lewisville, TX 75057

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--

Chuck Williamson, P.G.
Geologist - Stream Alteration/Dam Safety
O: (801) 538-7404
E: charleswilliamson@utah.gov

Utah Department of Natural Resources
Division of Water Rights

waterrights.utah.gov

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State of Utah

SPENCER J. COX
Governor

DEIDRE M. HENDERSON
Lieutenant Governor

Department of Natural Resources

JOEL FERRY
Executive Director

Public Lands Policy Coordinating Office

REDGE B. JOHNSON
Director

April 29, 2024

Submitted electronically: mpeters@GESonline.com

Madison Peters
Consultant
Groundwater & Environmental Services, Inc.
810 Office Park Circle, Suite 113
Lewisville, TX 75057

Subject: **Cape Modern Geothermal**

Dear Ms. Peters,

The state of Utah, through the Public Lands Policy Coordinating Office, in collaboration with the Utah Division of Wildlife Resources (DWR), appreciates the opportunity to meet with Groundwater & Environmental Services, Inc. and FERVO to review and discuss wildlife impact minimization and mitigation measures as part of the early coordination process for the proposed Cape Modern geothermal project's upcoming Environmental Assessment.

The proponents conducted geothermal testing in the area that could be affected by the project. Testing results found viable geothermal sources, and the proponents are moving forward to production planning. DWR appreciates having early coordination and discussions with the project team in November 2023 and again in February 2024. The DWR values the consideration for wildlife by FERVO. Below is a summary of the wildlife considerations discussed:

- Portions of the project are on private lands, and DWR appreciates FERVO's consideration of wildlife and habitat, regardless of land ownership, as wildlife and energy are both important to Utahns.

- The FERVO project area is outside the greater sage-grouse habitat or management areas. DWR appreciates the request for clarification.

- FERVO expressed a concern about wildlife moving into the project area. There would likely not be a need to stop construction activities once construction has begun. On-site personnel should keep a reasonable distance, and the wildlife should move out of the area. However, if injured wildlife are observed or if there are concerns for wildlife onsite, contact Jess Kinross with DWR.

- One of the habitat management goals in the Utah Pronghorn Statewide Management Plan is to conserve and improve pronghorn habitat throughout the state. To achieve this goal, the plan identified a strategy to work with agency and industry representatives to design mitigation or habitat treatments that offset the impacts of energy development or other surface disturbing actions in pronghorn habitat. The DWR previously agreed to contribute to a wildlife drinking water development project to offset impacts from drilling. The production footprint overlaps with low, medium, and high-density use areas for pronghorn (Attachment 1). As discussed at our meeting, FERVO can voluntarily mitigate direct and indirect impacts on pronghorn at a 4:1 ratio within high-density use areas, or at a 1:1 ratio for habitat within the entire project footprint. Reestablishing and improving the shrub community near the project area would enhance habitat quality for pronghorn. FERVO offered to contribute up to $150,000 towards mitigation efforts. The DWR will coordinate with FERVO to finalize mitigation plans and establish a memorandum of understanding to outline both parties' commitments, such as the DWR acquiring materials and implementing the mitigation projects. At the same time, FERVO can formalize any monetary contributions toward project implementation.

- The DWR recommends the project consider avian species, including raptors when developing transmission power lines. If possible, buried powerlines can reduce avian injury or fatality. Overhead power poles should be constructed to avian-safe design standards, including adequate separation between phases and covers to insulate equipment and potential phase-to-ground interactions. DWR recommends both the "*Suggested Practices for Avian Protection on Power Lines, the State of the Art in 2012" and the "Avian Protection Plan (APP) Guidelines*" for design considerations to minimize raptor electrocution.

- DWR recommends considering kit foxes and burrowing owls for project-related activities. Kit fox dens occupied by pups should be avoided during pup-rearing from February 1- July 30. If construction activities occur during pup-rearing, DWR

recommends surveys be performed. If active kit fox dens are found, artificial burrows can be used to encourage them away from project-related activities. If burrowing owls are found onsite, construction should be avoided within 0.25 miles of their burrow from March 15 - August 15.

- DWR understands the project is considering burying pipelines. DWR recommends all trenching occur with concurrent backfilling, or that escape ramps be placed within any open pits during construction. If the pipeline cannot be buried and is elevated, sufficient clearance should be considered to allow adequate passage for pronghorn and other wildlife.

- DWR recommends the production project consider using exclusionary fencing around reserve pits to protect the big game from entering pits, similar to what was done during the exploration phase. If other types of fencing are proposed for different aspects of the project, please consider using wildlife-friendly fencing. Another project consideration would be adding design features to help minimize impacts on small wildlife from exposure or entrapment in reserve pits. The Record of Decision and Resource Management Plan Amendments for Geothermal Leasing in the Western United States December 2008 identifies best management practices, including escape ramps for small wildlife (BMP B.4.6).

If you have wildlife questions, contact the DWR's Impact Analysis Biologist in our Cedar City office, Jessica Kinross, at jessicavan@utah.gov or 435-691-2372.

Please call to discuss any further questions or concerns.

Sincerely,

Redge B. Johnson
Director

State of Utah

SPENCER J. COX
Governor

DEIDRE M. HENDERSON
Lieutenant Governor

Department of Natural Resources

JOEL FERRY
Executive Director

Public Lands Policy Coordinating Office

REDGE B. JOHNSON
Director

June 26, 2024

Submitted electronically: mpeters@GESonline.com

Madison Peters
Consultant
Groundwater & Environmental Services, Inc.
810 Office Park Circle, Suite 113
Lewisville, TX 75057

Subject: **Cape Modern Geothermal Supplemental Comments**
Beaver County

Dear Ms. Peters,

The Utah Division of Wildlife Resources (DWR) met with Groundwater & Environmental Services, Inc. (GES) and FERVO to review and discuss wildlife impact minimization and mitigation measures as part of the early coordination process for the proposed Cape Modern geothermal project's upcoming Environmental Assessment.

The state of Utah, through the Public Lands Policy Coordinating Office, in collaboration with the Utah Division of Wildlife Resources (DWR), provided a letter to Madison Peters with GES on April 29, 2024. Per recent developments, the project is looking to pursue construction anywhere in their area of interest (AOI; see attached map). The DWR provides the following additional supplemental information to address the expanded project footprint for your consideration.

The AOI boundary overlaps with the Bald Hills Sage-Grouse Management Area (SGMA), as defined in the Utah Conservation Plan for Greater Sage-Grouse. However, the project is opting to avoid surface disturbance within the SGMA as FERVO can access geothermal resources below those areas via horizontal drilling. Avoiding surface disturbing activities within the SGMA would avoid any impacts on potential habitats within the SGMA. If the project plans change and the project cannot avoid surface disturbance within the SGMA,

please coordinate project plans with the DWR to assess potential impacts to greater sage-grouse within the SGMA and potential mitigation options.

Additionally, the northeastern corner of the AOI contains crucial mule deer winter habitat. The DWR recommends avoiding construction within this crucial winter range from Dec. 1 to April 15. The mitigation plan the DWR and GES collaboratively developed contributes to water development and shrub enhancements, which should offset impacts on mule deer.

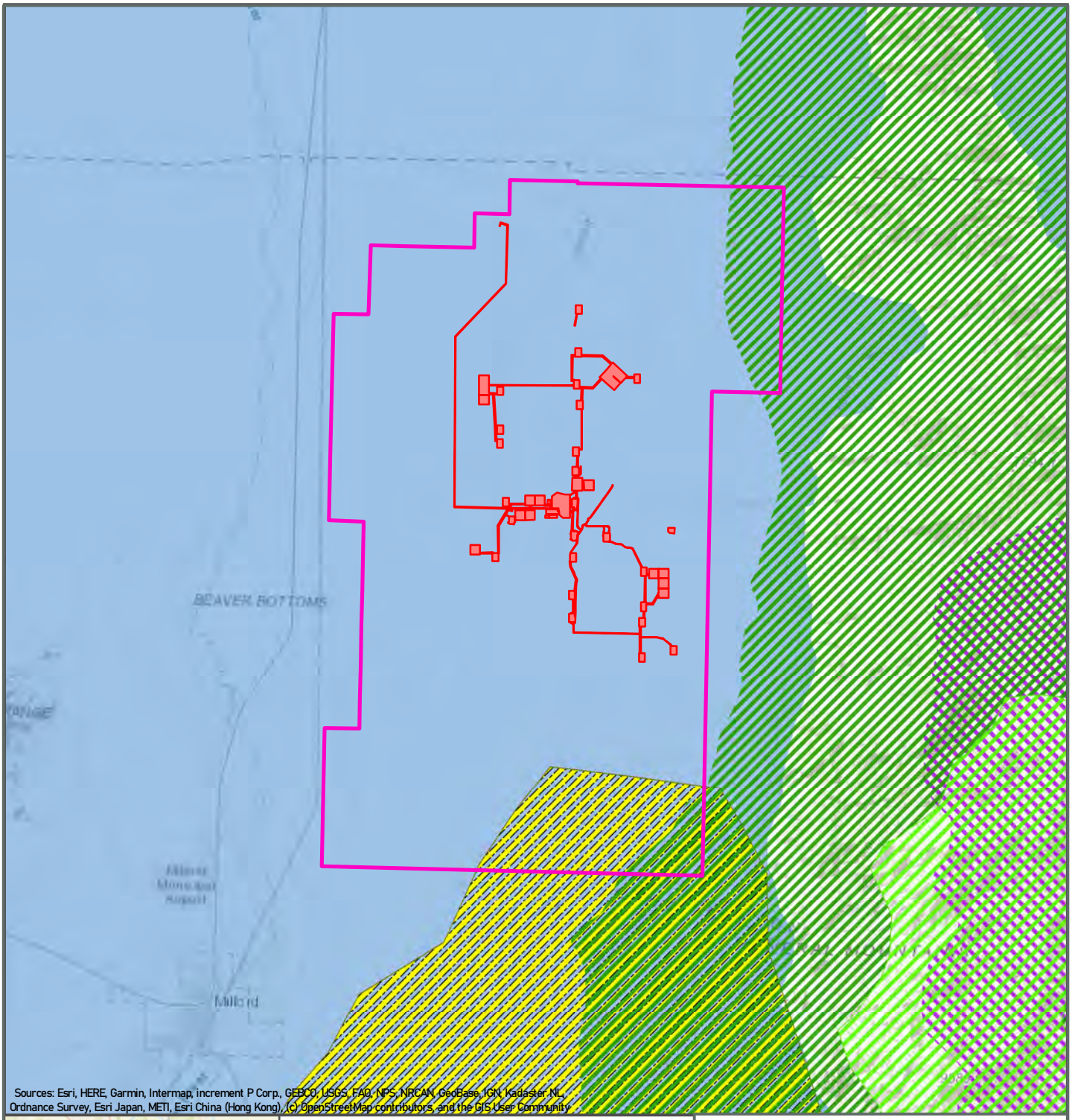
Lastly, the DWR has reviewed photos provided by GES. DWR concluded that some areas contain sagebrush too sparse and patchy to be considered pygmy rabbit habitat; however, habitats in other areas could not be determined from the photos. The pygmy rabbit signs (scat, burrows, etc.) would be a better indicator to determine if the area contains habitat. Surveys could be done to determine whether pygmy rabbits are in the area.

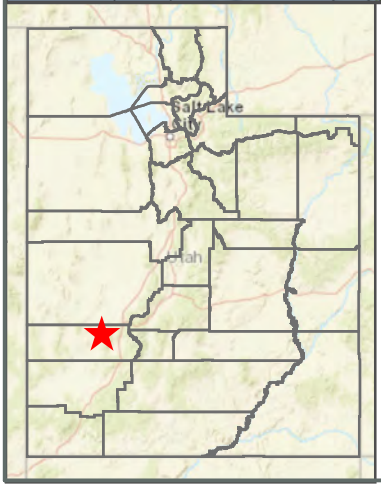
If you have wildlife questions, contact the DWR's Impact Analysis Biologist in our Cedar City office, Jessica Kinross, at jessicavan@utah.gov or 435-691-2372.

Please call to discuss any further questions or concerns.

Sincerely,

Redge B. Johnson
Director





Legend

- Project
- Area of Interest

Game Habitat

- Mule Deer Crucial Winter
- Mule Deer Substantial Summer
- Utah SGMAs
- Rocky Mountain Elk Substantial Year-long Habitat
- Pronghorn Crucial Year-long Habitat

Cape Geothermal Power Project

Beaver County, Utah
Habitat Map

Drawn	MP
Designed	MP
Approved	JS
Date	5-6-24
Figure	

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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APPENDIX F

Public Comments and Responses

(Comments and Responses will be uploaded with Final EA)

Fervo Production EA Comment Responses

Respondent #	Respondent Name	Organization or Affiliation	Respondent Type
1	Craig Wallentine		Non-substantial
2	Lauren Barros	Wasatch Back Chapter of Citizens' Climate Lobby	Non-substantial
3	Matt Robinson	Beaver City	Non-substantial
4	Nolan Davis		Non-substantial
5	Not provided	Utah FORGE	Non-substantial
6	Not provided		Non-substantial
7	Sindy Smith	Utah PLPCO	Non-substantial
8	Logan Mitchell	Utah Clean Energy	Non-substantial
9	Bill Barron	Wasatch Front Chapter of Citizens' Climate Lobby	Non-substantial
10	Keven Whicker	Beaver County	Non-substantial
11	Stephanie Barber-Renteria	School and Institutional Trust Lands Administration	Non-substantial
12	Jody Ostendorf	Environmental Protection Agency	Response
13	Utahn (Provided Name)		Non-substantial
14	Not Provided		Non-substantial

#	Public Concerns by Resource Topic	Respondent #	Response
1.0	**Alternatives Analysis**		
1.1	The EPA notes that aside from the "No Action" alternative, the EA only offers the "Proposed Action" and does not consider a reasonable range of alternatives. A range of alternatives should be included to explore options that avoid or minimize environmental impacts. The EPA	12	The alternative presented represents the best case available given various physical constraints imposed by the resource itself. The project proponent has voluntarily reduced project impacts by consolidating and co-locating the various project surface improvements necessary. The

	suggests further consideration of alternative options, such as different placement of well pads and infrastructure, to meet the purpose and need while reducing environmental impacts (e.g., avoiding areas with intermittent streams).		presence of widespread cultural resources in the project area further limit and constrain any viable alternatives. NEPA Sec102(2)(E) states that alternatives need to be considered when a proposal "involves unresolved conflicts concerning alternative uses of available resources;..." Design features are already proposed which would reduce potential impacts to the level well below significance. No additional alternatives are required when there are no unresolved conflicts related to potential significant impacts of resources.
1.2	The explanation in the EA ("no other alternatives were identified that would meet the purpose and need") is insufficient. The BLM does not provide a detailed rationale for why no other alternatives were considered. If no other alternatives are viable, the EPA requests that the BLM provide a clearer, more detailed explanation of why no other alternatives could meet the project's purpose and need.	12	See 1.1
2.0	**Resources Considered for Detailed Analysis**		
2.1	Air Resources:		
2.1.1	The EA fails to adequately assess air quality impacts despite acknowledging compliance with regulations.	12	The BLM NEPA Handbook (H-1790-1) states in Section 6.4 that resources only need to be analyzed in detail when they meet the following criteria: • Analysis of the issue is necessary to make a reasoned choice between alternatives. That is, does it relate to how the proposed action or alternatives respond to the purpose and need? • The issue is significant (an issue associated with a significant direct, indirect, or cumulative impact, or where

			analysis is necessary to determine the significance of impacts). Air quality in the project area is stated in the EA to be meeting regulatory standards and that the project would not change air quality to reach regulatory thresholds. Consequently, air quality impacts would not be a deciding factor when making a reasoned choice between alternatives nor would they likely reach a level of significance. According to this section of the NEPA Handbook, a detailed analysis of this resource would not then be required.
2.1.2	A thorough analysis of direct, indirect, and cumulative impacts from drilling 320 wells is necessary, as similar projects have shown significant air quality concerns.	12	The proponent has recently transitioned to the use of utility electric power to power its drilling operations which removes diesel emissions as an issue from its proposed drilling operations.
2.1.3	The EA does not adequately utilize existing monitoring networks to assess current deposition and emissions from known sources.	12	It is known that current air quality standards are being met and that the drilling operations would not exceed regulatory thresholds. Monitoring networks would consequently not be necessary.
2.1.4	The analysis needs to address emissions from geothermal activities, impacts on criteria pollutants, AQRVs in sensitive areas, and health risks from hazardous air pollutants (HAPs).	12	Closed-loop geothermal power plants, being sealed from the atmosphere, are de-minimus sources of regulated air pollutants. Drilling operations will be powered by utility electricity. Fugitive dust generation from vehicle travel on project access roads will be controlled by enforced travel speed limits, road graveling, watering and dust suppression applications as necessary. See response to Comment 2.1.1.
2.1.5	There's a lack of characterization for existing air quality and Air Quality Related Values (AQRVs), which is essential for understanding potential impacts.	12	See Response to Comment 2.1.1

3.0	**Environmental Effects and Impacts**		
3.1	Naturally Occurring Radioactive Materials		
3.1.1	The EA should differentiate between NORM and TENORM and assess the associated risks more thoroughly.	12	Since there are no known sources of NORM in the project area, it would be unlikely that they would become concentrated through geothermal production activities. The possibility of this happening is too small to meet the criteria set forth in the response to Comment 2.1.1. However, a design feature will be added to Appendix D that would allow for testing of water brought forth from the wells for radioactivity.
3.1.2	To confirm the presence of NORM and TENORM, verification sampling of the host formation and operational waters is recommended.	12	See 3.1.1
3.1.3	If NORM poses a risk of becoming TENORM, a stipulation should require the development of a radiological monitoring plan to mitigate exposure risks.	12	See 3.1.1
3.1.4	The Final EA should address how TENORM will be isolated, disposed of, and strategies to reduce or avoid its generation during project activities.	12	See 3.1.1
3.2	Water Resources		
3.2.1	The BLM did not address water resources in the list of issues considered or eliminated from detailed analysis. The EPA notes that many intermittent and ephemeral streams in the project area are not evaluated, which raises concerns about the potential for permanent impacts from infrastructure such as well pads.	12	The IDT checklist in Appendix C of the EA identifies Water Resources/Quality as present but not impacted to a degree requiring detailed analysis (NI). See the IDT checklist for rationale related to why detailed analysis is not warranted. Issues that are identified but dismissed from detailed analysis typically were initially identified as having potential for impacts needing detailed analysis and were dismissed through surveys or applicant committed design features.

3.2.2	The EA lacks a map or detailed evaluation of water resources, making it unclear how impacts to these streams will be avoided, minimized, or mitigated. Despite stating no impacts to water resources, the BLM does not provide supporting analysis to justify this conclusion.	12	Updated rationale in IDT checklist
3.2.3	The EPA emphasizes the critical ecological functions of intermittent and ephemeral streams, which include nutrient cycling, groundwater recharge, and sediment transport. These streams, which make up most of the water resources in the region, should be fully analyzed for direct, indirect, and cumulative impacts.	12	Updated rationale in IDT checklist
3.2.4	Construction and operation activities, such as well pads and road crossings, may disturb the hydrological functions of streams, leading to long-term surface water quality degradation. The lack of setbacks between infrastructure and streams further exacerbates the risk	12	Added 100-foot setbacks where possible. Where it's not feasible, stipulations were added for the development of site-specific storm water pollution protection plans.
3.2.5	Road-stream crossings are highlighted as major contributors to sediment input into streams, especially during flood events when culverts may fail. The EA lacks sufficient detail on culvert design, raising concerns about erosion and sedimentation.	12	Section 2.2 of the Plan of Operations states culverts will be installed "pursuant to standards established in the Gold Book (Fourth Edition – Revised 2007)." These standards mandate all culverts must be constructed to withstand a 25-year flood event and at minimum be 18 inches in diameter.
3.2.6	The EPA questions why the Area of Interest for the EA does not account for cumulative impacts from other existing developments in the region, such as the Utah FORGE geothermal project and other renewable energy installations. The agency recommends including cumulative impacts to geology, soils, and water resources from these	12	The cumulative impacts from other resources in the area but outside of the AOI were considered by the BLM ID Team (Appendix C.). Cumulative impacts for issues analyzed in detail were carried forward into the analysis even if not specifically labeled as "renewable". As required by NEPA the BLM IDT considered in their rationale, why or why not these resources should be considered in detailed analysis and whether or not the

	projects, as they could affect the same ecosystems.		cumulative effects were required to be analyzed in detail. While not analyzed in detail, it does not mean that the cumulative impacts to the resources were not considered.
3.2.7	The EPA notes that design features in the EA, such as stormwater control measures, are not a substitute for a comprehensive impacts analysis. Mitigation strategies should be clearly defined, and protective measures like culverts and erosion control should be more thoroughly addressed. The EPA strongly recommends that the BLM provide a more detailed analysis of water resources in the project area and thoroughly assess the potential cumulative impacts from the proposed development and surrounding activities.	12	See updated IDT checklist for rationale as to why water resources are not carried forward for detailed analysis. The BLM specialists make the determination along the guidelines set forth in the NEPA as whether to carry a certain issue forward for detailed analysis or just a brief analysis as to why the issue is not analyzed in detail.
4.0	**Mitigation, BMPs, Design Features**		
4.1	The EPA notes that the EA does not include any Design Features establishing setback distances from aquatic resources to mitigate potential water quality impacts. The EPA recommends that the BLM include required setback distances from aquatic resources in the Final EA to protect water quality	12	The IDT checklist identifies Water resources/Quality as present but not impacted to a degree requiring detailed analysis (NI). See the IDT checklist for rationale related to why detailed analysis is not warranted. Water resources within project area are seasonal and typically ephemeral. BLM inventories and monitors riparian areas within the CCFO and no areas that show riparian characteristics (veg, soils) have been documented within project area. Design features have been added to address potential impacts to water quality from ephemeral washes through the recommendation of 100-foot setbacks where applicable. See Appendix C. IDT Checklist.
4.2	The EPA is concerned that the EA does not identify who will be responsible for monitoring, oversight, and enforcement of BMPs (Best	12	Pre-construction critical resource (sensitive species wildlife and cultural resources) survey reports are required to be submitted in advance of any new project

	Management Practices), Design Features, and commitments outlined in the Gold Book. The EPA requests that the BLM clearly identify which entity will be responsible for ensuring that BMPs, Design Features, and the Gold Book commitments are implemented and followed.		disturbances. For the federal land disturbances in the overall project, compliance inspections for downhole compliance issues will be assigned to a BLM Petroleum Engineering Technician. Compliance monitoring of surface disturbances will be assigned to the BLM Field Office geologist and/or a BLM surface reclamation specialist.

ePLANNING

Comment Submission

Project: DOI-BLM-UT-C010-2024-0018-EA - Fervo Cape Geothermal Power Project

Document: DRAFT_DOI-BLM-UT-C010-2024-0018-EA Fervo Production EA.pdf

Submission ID: FervProd-1-500713135

Comment

To Color Country BLM Office:

This is the most intelligent and worthwhile Environmental Assessment I have seen produced in Utah in years. Compared with the poorly conceived and unneeded Pine Valley Water DEIS, this Environmental Assessment:

1) Accurately defines a very worthwhile project that benefits both the long term public interest in clean, firm energy independence and the development of cutting edge technology by private investors

2) Satisfactorily addresses key environmental issues like seismicity and the toxicity of drilling fluids upfront

3) Discusses the long term nature of geothermal heat management in the area demonstrating that it is not a limited resource like water

4) In general, this is a well thought-out and professionally designed project that is highly likely to succeed as opposed to a clumsy local water project that ignored obvious conservation alternatives

I fully support a decision to approve the Cape Geothermal Power Project and approve the transmission line tie-in facilities.

Thank you,

Craig Wallentine

Submitter(s)

Submitter 1

Name: Wallentine, Craig
Address: Not Provided
Group or Organization Name: Not Provided

Disclaimer

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment - including your personal identifying information - may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

(Withhold my personally identifying information from future publications on this project) - *YES*

ePLANNING

Comment Submission

Project: DOI-BLM-UT-C010-2024-0018-EA - Fervo Cape Geothermal Power Project

Document: DRAFT_DOI-BLM-UT-C010-2024-0018-EA Fervo Production EA.pdf

Submission ID: FervProd-1-500713183

Comment

Comment on behalf of Wasatch Back Citizens' Climate Lobby, in support of the Environmental Assessment:

As Co-Leader of the Wasatch Back Citizens' Climate Lobby, I write on behalf of our chapter to support the Fervo Cape Geothermal Power Project draft Environmental Assessment.

In April of 2024, Fervo invited our chapter to visit the site. Along with 15 members of our CCL Chapter and local officials from a neighboring county, I toured the site and spoke with the employees at length. Any concerns we had about the safety of the activities or the impact on the local community were put to rest. In fact, we were impressed with the efforts Fervo has taken to work with and listen to the local community. Moreover, Fervo's safety practices seemed top notch.

CCL supports geothermal energy because it provides firm, dispatchable, clean power, which we sorely need to avoid the worst effects of climate change. We fully embrace the Biden Administration's goal of a carbon free pollution sector by 2035, as well as Congress' direction in the Energy Act of 2020 to permit 25 gigawatts of solar, wind, and geothermal production on public lands no later than 2025.

Fervo's enhanced geothermal power would bring good jobs and much needed property tax income to Beaver County. Utah's Renewable Energy Corridor provides a terrific location for this activity, as it is already home to the Blundell Geothermal Plant, acres of solar arrays, wind farms, and transmission lines.

Submitter(s)

Submitter 1

Name: Barros, Lauren
Address:7156 Pinebrook Road, Park City, Utah 84098
Email Address: lrb@lrbfamilylaw.com
Phone Number: 8015988218
Group or Organization Name: Wasatch Back Chapter of Citizens' Climate Lobby
Position: Co-Leader
(Add me to the project mailing list) - ***YES***

Disclaimer

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment - including your personal identifying information - may

be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

(Withhold my personally identifying information from future publications on this project) - ***NO***

ePLANNING

Comment Submission

Project: DOI-BLM-UT-C010-2024-0018-EA - Fervo Cape Geothermal Power Project

Document: DRAFT_DOI-BLM-UT-C010-2024-0018-EA Fervo Production EA.pdf

Submission ID: FervProd-1-500713260

Comment

Having worked with Fervo on the Fervo Cape Geothermal Power Project as the mayor of Beaver City, as well as in a role as a private party stake holder. I am more than casually acquainted with Fervo and this project. They are a well-positioned, well-prepared, and well-intentioned group. Each interaction and learning opportunity confirms and re-confirms Fervo and the Fervo Cape Geothermal Power Project is on the path to sustainable success. They approach each aspect of the project with responsibility and tenacity, and with the positive interest of the community in mind. Additionally, the power resource they are working to provide is key to the positive economic development and quality of life in our region. I lend my full support to this group and to this project.

Submitter(s)

Submitter 1

Name: Robinson, Matt
Address: Not Provided
Group or Organization Name: Beaver City
Position: Mayor

Disclaimer

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(Withhold my personally identifying information from future publications on this project) - ***NO***

ePLANNING

Comment Submission

Project: DOI-BLM-UT-C010-2024-0018-EA - Fervo Cape Geothermal Power Project

Document: DRAFT_DOI-BLM-UT-C010-2024-0018-EA Fervo Production EA.pdf

Submission ID: FervProd-1-500714056

Comment

To whom it may concern,
I have been following the geothermal project for almost 8 years since Forge started its testing.
When FERVO came along and took all the data that Forge had accumulated and started to accelerate the geothermal process, it became very exciting.
I have closely watched the process and support this method of generating clean reliable energy for the future.
We need reliable clean energy and FERVO has demonstrated to be remarkable with strong ethical values and has become a part of this community.
As a member of the community, we have always had a goal to continue moving forward, and what better way than to collaborate and have a long lasting
relationship with a company like FERVO that wants to take care of the environment and support the local economy.
I appreciate the opportunity to be able to comment and support the FERVO Cape Geothermal Project 100 percent
Kindness regard
Nolan Davis

Submitter(s)

Submitter 1

Name: Davis, Nolan
Address: Not Provided
Group or Organization Name: Not Provided

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(Withhold my personally identifying information from future publications on this project) - ***NO***

ePLANNING

Comment Submission

Project: DOI-BLM-UT-C010-2024-0018-EA - Fervo Cape Geothermal Power Project

Document: DRAFT_DOI-BLM-UT-C010-2024-0018-EA Fervo Production EA.pdf

Submission ID: FervProd-1-500714056

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We need reliable clean energy and FERVO has demonstrated to be remarkable with strong ethical values and has become a part of this community.
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relationship with a company like FERVO that wants to take care of the environment and support the local economy.
I appreciate the opportunity to be able to comment and support the FERVO Cape Geothermal Project 100 percent
Kindness regard
Nolan Davis

Submitter(s)

Submitter 1

Name: Davis, Nolan
Address: Not Provided
Group or Organization Name: Not Provided

Disclaimer

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(Withhold my personally identifying information from future publications on this project) - ***NO***

ePLANNING

Comment Submission

Project: DOI-BLM-UT-C010-2024-0018-EA - Fervo Cape Geothermal Power Project

Document: DRAFT_DOI-BLM-UT-C010-2024-0018-EA Fervo Production EA.pdf

Submission ID: FervProd-1-500714082

Comment

This is a thorough and well-thought out plan. There are no questions or suggestions.

Submitter(s)

Submitter 1

Name: Not Provided
Address: Not Provided
Group or Organization Name: Utah FORGE

Submitter 2

Name: Not Provided
Address: Not Provided
Group or Organization Name: Not Provided

Disclaimer

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(Withhold my personally identifying information from future publications on this project) - ***NO***

ePLANNING

Comment Submission

Project: DOI-BLM-UT-C010-2024-0018-EA - Fervo Cape Geothermal Power Project

Document: DRAFT_DOI-BLM-UT-C010-2024-0018-EA Fervo Production EA.pdf

Submission ID: FervProd-1-500714080

Comment

There appear to be no issues with this plan

Submitter(s)

Submitter 1

Name: Not Provided
Address: Not Provided
Group or Organization Name: Not Provided

Disclaimer

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(Withhold my personally identifying information from future publications on this project) - ***NO***

ePLANNING

Comment Submission

Project: DOI-BLM-UT-C010-2024-0018-EA - Fervo Cape Geothermal Power Project

Document: DRAFT_DOI-BLM-UT-C010-2024-0018-EA Fervo Production EA.pdf

Submission ID: FervProd-1-500714116

Comment

The state of Utah ("State"), through the Utah Office of Energy Development and Utah Public Lands Policy Coordinating Office, submits the following comments in collaboration with the Utah Division of Wildlife Services ("DWR") on the Environmental Assessment for the FERVO Cape Geothermal Power Project. The State strongly supports the proposed action, which will facilitate the development of reliable, dispatchable, and clean electrical power generation. The project will allow for the development of approximately 23 well pads for drilling and production, up to 20 geothermal power plants, associated access roads, a power distribution network composed of sub-transmission lines, an electrical switchyard, a general tie-in transmission line, geothermal fluid pipeline gathering system, and ancillary facilities. Geothermal energy has the potential to play a central role in Utah's energy portfolio, and projects such as this one on BLM land are essential to developing Utah's vast geothermal resources.

The State encourages the responsible and appropriate development and use of natural resources to promote economic development for the benefit of its citizenry. The BLM is required to make land use decisions in a manner consistent with state and local plans to the greatest degree possible, consistent with federal law.

Utah's State Energy Policy prioritizes energy resources that are 1) adequate, 2) reliable, 3) dispatchable, 4) affordable, 5) sustainable, 6) secure, and 7) clean. Utah Code 79-6-301(1)(a)(ii). Geothermal energy meets all these attributes and warrants high prioritization on BLM lands. A key element of the proposed project is its minimal footprint – although the Area of Interest for the proposed project consists of approximately 34,813 acres, only 155 acres of BLM land are expected to have surface-disturbing impacts. Such low-impact energy development minimizes damage to surrounding resources while preserving wildlife habitat and livestock grazing rangelands. The relatively small footprint of the proposed project within the Area of Interest could potentially allow for the development of other energy resources in the vicinity of the proposed project, such as solar energy. The proposed project fits well within the BLM's mission to promote the "multiple-use and sustained yield" of BLM lands, as the vast majority of land within the Area of Interest will still be available for other sustainable uses.

FLPMA directs the BLM to render its planning efforts "consistent with State and local plans to the maximum extent [the Secretary of the Interior] finds consistent with Federal law and the purposes of [FLPMA]." 43 U.S.C. § 1712(c)(9). The BLM's proposed action is consistent with the geothermal energy provisions of both Utah's 2023 Resource Management Plan and the 2017 Beaver County Resource Management Plan, both of which contain policies and objectives prioritizing the development of geothermal energy.

Although the EA makes little mention of the economic benefits to the surrounding area, it is important to emphasize that in a rural county such as Beaver County, Utah, even small increases in long-term, stable jobs can have a significant impact on local communities. Jobs created by the proposed project will allow families of project employees to live in a region of Utah facing significant economic headwinds. Continued development of geothermal resources on BLM land will provide additional socioeconomic benefits to rural Utahns. Royalty

revenue from the project may also have a significant beneficial impact on local government and the surrounding community.

Division of Wildlife Resources

DWR appreciates the ongoing coordination and incorporation of its comments throughout the project planning. The design features, plan of development, and lease stipulations incorporated DWR's previously provided wildlife recommendations. DWR encourages FERVO to work with DWR and the BLM wildlife biologists to determine the height and siting of any above-ground large-diameter pipes, to allow for big game passage underneath. FERVO's contributions towards the construction of a water development and shrub enhancement project will benefit multiple wildlife species, including pronghorn, mule deer, migratory birds, and small animals, thereby minimizing impacts on wildlife and their habitats. If you have wildlife questions, contact Jessica Kinross, Impact Analysis Biologist, at jessicavan@utah.gov or 435-691-2372, DWR's Cedar City office.

In Conclusion, the State requests that the BLM issue a Decision Record authorizing the approved action, which will provide numerous environmental and socio-economic benefits with minimal impacts on the landscape. The State encourages the BLM to continue working constructively with the project proponents to help bring the proposed project to the next stage of its development.

The State appreciates the opportunity to provide comments.

Upload File(s)

Files

FERVO Cape Geothermal Power Project Comments.pdf

Submitter(s)

Submitter 1

Name: Smith, Sindy
Address: Not Provided
Email Address: sindysmith@Utah.gov
Group or Organization Name: State of Utah, PLPCO/OED
(Add me to the project mailing list) - ***YES***

Disclaimer

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(Withhold my personally identifying information from future publications on this project) - ***NO***

State of Utah

SPENCER J. COX
Governor

DEIDRE M. HENDERSON
Lieutenant Governor

Utah Department of Natural Resources

JOEL FERRY
Executive Director

Utah Public Lands Policy Coordinating Office

REDGE B. JOHNSON
Director

Utah Office of Energy Development

DUSTY MONKS
Interim Director

September 20, 2024

Submitted electronically: https://eplanning.blm.gov/eplanning-ui/project/2033002/510

Jacqueline Russell
Acting Field Manager
Cedar City Field Office
Bureau of Land Management
176 East D.L. Sargent Drive
Cedar City, UT 84721

Subject: **FERVO Cape Geothermal Power Project**
DOI-BLM-UT-C010-2024-0018-EA
RDCC Project No. 86245

Dear Ms. Russell:

The state of Utah ("State"), through the Utah Office of Energy Development and Utah Public Lands Policy Coordinating Office, submits the following comments in collaboration with the Utah Division of Wildlife Services ("DWR") on the Environmental Assessment for the FERVO Cape Geothermal Power Project. The State strongly supports the proposed action, which will facilitate the development of reliable, dispatchable, and clean electrical power generation. The project will allow for the development of approximately 23 well pads for drilling and production, up to 20 geothermal power plants, associated access roads, a power distribution network composed of sub-transmission lines, an electrical switchyard, a general tie-in transmission line, geothermal fluid pipeline gathering system, and ancillary facilities. Geothermal energy has the potential to play a central role in Utah's energy portfolio, and projects such as this one on BLM land are essential to developing Utah's vast geothermal resources.

The State encourages the responsible and appropriate development and use of natural resources to promote economic development for the benefit of its citizenry. The BLM is required to make land use decisions in a manner consistent with state and local plans to the greatest degree possible, consistent with federal law.

Utah's State Energy Policy prioritizes energy resources that are 1) adequate, 2) reliable, 3) dispatchable, 4) affordable, 5) sustainable, 6) secure, and 7) clean.[1] Utah Code 79-6-301(1)(a)(ii). Geothermal energy meets all these attributes and warrants high prioritization on BLM lands. A key element of the proposed project is its minimal footprint – although the Area of Interest for the proposed project consists of approximately 34,813 acres, only 155 acres of BLM land are expected to have surface-disturbing impacts. Such low-impact energy development minimizes damage to surrounding resources while preserving wildlife habitat and livestock grazing rangelands. The relatively small footprint of the proposed project within the Area of Interest could potentially allow for the development of other energy resources in the vicinity of the proposed project, such as solar energy. The proposed project fits well within the BLM's mission to promote the "multiple-use and sustained yield" of BLM lands, as the vast majority of land within the Area of Interest will still be available for other sustainable uses.

FLPMA directs the BLM to render its planning efforts "consistent with State and local plans to the maximum extent [the Secretary of the Interior] finds consistent with Federal law and the purposes of [FLPMA]." 43 U.S.C. § 1712(c)(9). The BLM's proposed action is consistent with the geothermal energy provisions of both Utah's 2023 Resource Management Plan[2] and the 2017 Beaver County Resource Management Plan,[3] both of which contain policies and objectives prioritizing the development of geothermal energy.

Although the EA makes little mention of the economic benefits to the surrounding area, it is important to emphasize that in a rural county such as Beaver County, Utah, even small increases in long-term, stable jobs can have a significant impact on local communities. Jobs created by the proposed project will allow families of project employees to live in a region of Utah facing significant economic headwinds. Continued development of geothermal resources on BLM land will provide additional socioeconomic benefits to rural Utahns. Royalty revenue from the project may also have a significant beneficial impact on local government and the surrounding community.

Division of Wildlife Resources

DWR appreciates the ongoing coordination and incorporation of its comments throughout the project planning. The design features, plan of development, and lease

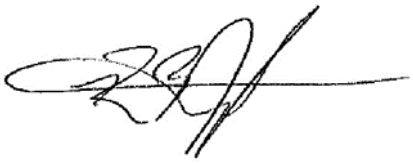
[1] While geothermal energy is currently not an affordable option for our residents, it is expected to become more accessible over time.
[2] 2023 Utah State Resource Management Plan, *available at* https://storymaps.arcgis.com/collections/81d4406668e34acca4d98275ee41cd07?item=1.
[3] 2017 Beaver County Resource Management Plan, *available at* https://utah-resource-management-planning-plpco.hub.arcgis.com/pages/county-management-plans.

stipulations incorporated DWR's previously provided wildlife recommendations. DWR encourages FERVO to work with DWR and the BLM wildlife biologists to determine the height and siting of any above-ground large-diameter pipes, to allow for big game passage underneath. FERVO's contributions towards the construction of a water development and shrub enhancement project will benefit multiple wildlife species, including pronghorn, mule deer, migratory birds, and small animals, thereby minimizing impacts on wildlife and their habitats. If you have wildlife questions, contact Jessica Kinross, Impact Analysis Biologist, at jessicavan@utah.gov or 435-691-2372, DWR's Cedar City office.

In Conclusion, the State requests that the BLM issue a Decision Record authorizing the approved action, which will provide numerous environmental and socio-economic benefits with minimal impacts on the landscape. The State encourages the BLM to continue working constructively with the project proponents to help bring the proposed project to the next stage of its development.

The State appreciates the opportunity to provide comments. Please contact us if you have any further questions.

Sincerely,



Redge B. Johnson
Director

Dusty Monks
Interim Director

ePLANNING

Comment Submission

Project: DOI-BLM-UT-C010-2024-0018-EA - Fervo Cape Geothermal Power Project

Document: DRAFT_DOI-BLM-UT-C010-2024-0018-EA Fervo Production EA.pdf

Submission ID: FervProd-1-500714109

Comment

See attached letter.

Upload File(s)

Files

2024-09-19 Fervo BLM NEPA letter of support.pdf

Submitter(s)

Submitter 1

Name: Mitchell, Logan
Address:215 S. 400 E., Salt Lake City, Utah 84111
Group or Organization Name: Utah Clean Energy
Position: Climate Scientist and Energy Analyst

Disclaimer

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(Withhold my personally identifying information from future publications on this project) - ***NO***

UTAH CLEAN ENERGY

September 19, 2024

Bureau of Land Management
Attn: Fervo Cape Geothermal Power Project EA
176 DL Sargent Drive,
Cedar City, UT 84721

Dear Bureau of Land Management,

Utah Clean Energy (UCE) is a 501(c)(3) nonprofit working to catalyze a rapid transition to an affordable, reliable, and clean energy system that positions Utah as a bold energy and climate leader. An essential component of our future electricity generation system will be having dispatchable, clean power production. Advanced geothermal is a promising new technology that has enormous potential to be a key part of a low-cost and reliable electricity system. Recent technological advances at the Cape Station project by Fervo have demonstrated the early stages of the technology and have achieved a rapid decline in drilling costs, which are essential to scale this technology and attain commercial viability.

We are excited to see new innovative projects pioneering this new technology in Utah. We understand that this project includes the development of approximately 23 well pads for drilling and completion of geothermal observation, production, and injection wells, up to 20 geothermal power plants, associated access roads, a power distribution network composed of sub-transmission lines, an electrical switchyard, a general tie-in transmission line, geothermal fluid pipeline gathering system, and ancillary facilities such as buildings and required tie-in upgrades.

We request that the Bureau of Land Management conduct a rapid and thorough review of the project so that it may proceed expeditiously. Rapid deployment of advanced geothermal technology will accelerate clean energy production in Utah, help the U.S. meet emission reduction goals, and ensure the U.S. is a leader in advanced geothermal technology that has enormous potential to be deployed worldwide.

Sincerely,

Logan Mitchell

Logan Mitchell
Climate Scientist and Energy Analyst

Utah Clean Energy
215 S. 400 E.
Salt Lake City, Utah 84111

ePLANNING

Comment Submission

Project: DOI-BLM-UT-C010-2024-0018-EA - Fervo Cape Geothermal Power Project

Document: DRAFT_DOI-BLM-UT-C010-2024-0018-EA Fervo Production EA.pdf

Submission ID: FervProd-1-500714115

Comment

Comment on behalf of Wasatch Front Citizens' Climate Lobby, in support of the
Environmental Assessment:
Sept 19th, 2024
As a member of the steering committee for the Wasatch Front Citizens' Climate Lobby, I write on behalf of our chapter in support for the Fervo Cape Geothermal Power Project draft Environmental Assessment.

We have been impressed with the efforts Fervo has taken to work with and listen to the local community.

We support geothermal energy because it provides firm, dispatchable clean power which we sorely need to avoid the worst effects of climate change and would bring good jobs and much needed property tax income to Beaver County.

Submitter(s)

Submitter 1

Name: Barron, Bill
Address: Not Provided
Group or Organization Name: Wasatch Front Chapter of Citizens' Climate Lobby
Position: Steering committee member

Disclaimer

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(Withhold my personally identifying information from future publications on this project) - ***NO***

ePLANNING

Comment Submission

Project: DOI-BLM-UT-C010-2024-0018-EA - Fervo Cape Geothermal Power Project

Document: DRAFT_DOI-BLM-UT-C010-2024-0018-EA Fervo Production EA.pdf

Submission ID: FervProd-1-500714124

Comment

Please see attached comments from Beaver County.

Upload File(s)

Files

9.19.24 Comments on Fervo Cape Geothermal Power Project.pdf
Cape Station Support Letter to BLM 9.19.24.pdf

Submitter(s)

Submitter 1

Name: Whicker, Keven
Address:105 E. Center St PO Box 789, Beaver, Utah 84713
Email Address: kevenwhicker@beaver.utah.gov
Phone Number: 435-438-6461
Group or Organization Name: Beaver County
Position: Natural Resource Specialist
(Add me to the project mailing list) - ***YES***

Disclaimer

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(Withhold my personally identifying information from future publications on this project) - ***NO***

BEAVER COUNTY COMMISSION

105 East Center
P.O. Box 789
Beaver, UT 84713
P: (435)438-6464

Wade Hollingshead
Chairman

Brandon Yardley
Member

Tammy T. Pearson
Member

September 19, 2024

BLM Cedar City Field Office
176 E DL Sargent Dr
Cedar City, UT 84721

ATTN: Fervo Cape Geothermal Power Project EA

Beaver County has reviewed the BLM's Draft Environmental Assessment concerning the Fervo Geothermal Power Project and would like to submit the following comments.

Beaver County is in favor of Fervo moving forward with the planned Cape Geothermal Power Project. Within the County Resource Management Plan, we acknowledge that we have the responsibility to expand the tax base and promote economic growth in order to elevate the standard of living for our citizens. One of the primary ways we can do this is through encouraging the development of energy resources within our county. This project promises to bring significant economic, environmental, and social benefits to our community and is in alignment with the county's vision for sustainable energy development.

Geothermal energy is a clean, renewable, and sustainable power source. As the nation pushes for more sustainable energy resources that reduce our dependence on fossil fuels, the Cape Geothermal Project offers an excellent alternative to coal and natural gas, which aligns with the current environmental goals of our nation.

Utilizing geothermal energy can help stabilize energy prices and improve energy independence in our region as well. Geothermal energy is a reliable, continuous and stable power supply. Unlike wind and solar, which are intermittent and variable, have limited life spans for the equipment, require large open landscapes and infringe on competing uses of public lands, geothermal is complementary to other land uses and far more desirable. The reliable, stable power supply from geothermal will contribute to regional energy security. The project footprint is comparatively small and does not hinder other public land uses.

As stated earlier, this power project aligns with existing land use plans and goals. Beaver County recognizes the importance of managing public lands responsibly, and we are confident that this project will be developed with minimal disruption to the local ecosystem, wildlife, recreational opportunities, and grazing activity, while providing long-term benefits for the community. We have been given many assurances that the technology of generating geothermal power by Fervo will be safe to our local aquifers and other ecosystems.

The economic repercussions from this project cannot be overstated. The Cape Geothermal Power Project represents a tremendous opportunity for economic growth in Beaver County. Geothermal energy development will bring long-term, high-quality jobs to our residents during both the construction and operational phases. These jobs are critical to supporting local families and adding new growth to the Milford area. Numerous local businesses will also benefit from the project construction and development. The tax revenue generated by this project will also bolster our county services. Additionally, there is a large potential for large scale, energy dependent businesses to locate near this proposed power project.

In conclusion, Beaver County fully supports the proposed Cape Geothermal Power Project and urges the Bureau of Land Management to approve the development of the estimated 320 geothermal production and injection wells and to construct the ancillary facilities. In addition, we would also urge the BLM to approve of the proposed ROW for the construction and maintenance of transmission lines and roads.

Sincerely,

Keven Whicker

Beaver County Natural Resource Specialist

BEAVER COUNTY

105 East Center
P.O. Box 789
Beaver, UT 84713
Ph: (435)438-6490

Wade Hollingshead
Chairman
Jen A. Wakeland
Director

Jen Wakeland
Strategic Development Director

9/19/2024

Bureau of Land Management
Cedar City, Utah

To whom it may concern,

I am writing on behalf of Beaver County's Economic Development Office to express our strong support for Fervo Energy's Cape Station Project, located just outside of Milford, Utah. This enhanced geothermal energy project represents a significant opportunity for our region, not only in terms of energy innovation but also for the economic vitality and sustainability of our community.

We are proud of the strong partnership that has been cultivated between Beaver County, Milford City, and Fervo Energy throughout this process. Together, we are committed to the growth and well-being of our local communities, and Fervo's dedication to responsible development aligns perfectly with our shared goals.

The Cape Station Project will provide substantial benefits to our county in the following key areas:

Local Economic Growth

The project will generate jobs in construction, operations, and maintenance, creating new career opportunities for Beaver County residents. These jobs, some of which will be long-term, represent a much-needed boost to the local labor market, allowing families to thrive and remain rooted in our rural community. It will also allow for a diversification of our economic portfolio, which will aid our county in weathering some of the highs and lows of more boom and bust industries that currently exist in Beaver County.

Attraction of Investment

Enhanced geothermal energy projects like Cape Station attract both private and public investment to the area. This project will not only bring direct financial benefits but will also act as a catalyst for further developments in other sectors such as manufacturing, energy technologies, agri-tech, and service industries. This influx of investment helps diversify our economic base and makes Beaver County an attractive location for future business ventures.

Infrastructure and Innovation

Fervo Energy's investment in geothermal technology will contribute to infrastructure improvements throughout Beaver County. As enhanced geothermal energy projects gain momentum, they pave the way for the introduction of additional energy innovations. Beaver County is poised to become a hub for cutting-edge energy solutions, attracting other businesses and developers seeking to capitalize on this trend.

Enhanced Tax Revenues

Increased property taxes, royalties, and leases stemming from this project will bolster Beaver County's tax revenues. These additional funds will allow us to invest in crucial public services such as education, transportation, and healthcare. Furthermore, improved infrastructure as a result of these revenues will benefit both residents and businesses, contributing to long-term economic stability.

Educational and Training Opportunities

Fervo Energy's Cape Station Project also presents a unique opportunity for educational partnerships. By working with local institutions, we can establish workforce training programs focused on geothermal energy, electrical engineering, and other renewable technologies. These programs will empower our residents with the skills needed for high-paying technical jobs, positioning Beaver County as a leader in energy innovation and workforce development.

In conclusion, the Cape Station Project promises to be a transformative endeavor for Beaver County. Its potential to generate significant economic, educational, and infrastructural benefits aligns with our community's vision for sustainable growth. We strongly urge the Bureau of Land Management to support this project and help bring it to fruition. Beaver County is eager to continue our collaborative work with Fervo Energy and other stakeholders to ensure the successful development of this geothermal energy initiative.

Thank you for your consideration of our letter of support. We look forward to the positive impact this project will have on our community and region.

Sincerely,

Jen Wakeland
Strategic Development Director
Beaver County, Utah

ePLANNING

Comment Submission

Project: DOI-BLM-UT-C010-2024-0018-EA - Fervo Cape Geothermal Power Project

Document: DRAFT_DOI-BLM-UT-C010-2024-0018-EA Fervo Production EA.pdf

Submission ID: FervProd-1-500714127

Comment

Please see the attached letter.

Upload File(s)

Files

FERVO Cape Geothermal Power Project Support Letter.pdf

Submitter(s)

Submitter 1

Name: Barber-Renteria, Stephanie
Address:102 South 200 East Suite 600, Salt Lake City, Utah 84111
Email Address: sbarberrenteria@utah.gov
Phone Number: 8015385156
Group or Organization Name: School and Institutional Trust Lands Administration
Position: Managing Director, Energy & Minerals
(Add me to the project mailing list) - ***YES***

Disclaimer

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(Withhold my personally identifying information from future publications on this project) - ***NO***

TRUST LANDS ADMINISTRATION
SUPPORTING UTAH SCHOOLS AND INSTITUTIONS

Michelle E. McConkie
Executive Director

102 South 200 East, Suite #600
Salt Lake City UT 84111
801-538-5100 Fax 801-355-0922
trustlands.utah.gov

September 20, 2024

Edward Ginouves
The Bureau of Land Management
Cedar City Field Office
176 E DL Sargent Dr.
Cedar City, Utah 84721

Submitted via BLM website: https://eplanning.blm.gov/eplanning-ui/project/2033002/510

Dear Mr. Ginouves,

Subject: DOI-BLM-UT-C010-2024-0018-EA
Comments on the Fervo Cape Geothermal Power Project EA

The Utah School and Institutional Trust Lands Administration (the "Trust Lands Administration" or "Administration") hereby submits these comments in support of the proposed action analyzed in the Cape Geothermal Power Project Environmental Assessment, August 2024.

The Trust Lands Administration is a Utah state agency tasked with managing approximately 4.4 million mineral acres (including geothermal) for the financial support of the State's K-12 public schools and 11 other public institutions. The Administration granted Escalante Desert Resources LLC ("EDR") the right to explore for and lease approximately 3,459.96 trust lands acres for geothermal exploration and development, pursuant to Exploration Agreement and Option to Lease Geothermal Resources, RNBL 2005-OBA, dated September 1, 2023 ("RNBL 2005"). The trust lands subject to RNBL 2005 are wholly within the federal Geothermal Exploration Unit designated on June 27, 2024 and 560 trust lands acres are within the Area of Interest ("AOI") analyzed in the above-referenced Environmental Assessment ("EA").

The trust lands within the boundaries of both the Geothermal Exploration Unit and the AOI cannot be economically developed on their own and the Trust Lands Administration supports the approval of the Project so that EDR can develop the geothermal potential of the entire area, including the trust lands. The Administration expects to receive significant revenue from development of the Cape Project, all of which will go to Utah's K-12 public schools.

The Trust Lands Administration appreciates and supports the BLM's management of the Geothermal Exploration Unit and appreciates EDR's work in pursuing technological advances in developing geothermal energy from Utah's West Desert area. The Trust Lands Administration supports the proposed action without reservation.

If you have any questions, please do not hesitate to contact me at 801-538-515 or by email at sbarberrenteria@utah.gov.

Yours sincerely,

Stephanie Barber-Renteria
Managing Director, Energy & Minerals

ePLANNING

Comment Submission

Project: DOI-BLM-UT-C010-2024-0018-EA - Fervo Cape Geothermal Power Project

Document: DRAFT_DOI-BLM-UT-C010-2024-0018-EA Fervo Production EA.pdf

Submission ID: FervProd-1-500714135

Comment

Hello, please see attached comments from U.S. EPA Region 8.

Upload File(s)

Files

Fervo Cape Geothermal Power Project EA comments FINAL 9.20.2024.pdf

Submitter(s)

Submitter 1

Name: Ostendorf, Jody
Address: Not Provided
Group or Organization Name: Not Provided

Disclaimer

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(Withhold my personally identifying information from future publications on this project) - ***NO***

REGION 8
DENVER, CO 80202

September 20, 2024

Ref: 8EJC-NE

Edward Ginouves
Bureau of Land Management
Attn: Fervo Cape Geothermal Power Project EA
176 E DL Sargent Drive
Cedar City, UT 8471

Submitted via BLM ePlanning portal

Dear Edward Ginouves:

The U.S. Environmental Protection Agency Region 8 has reviewed the U.S. Department of the Interior Bureau of Land Management Environmental Assessment (EA) for the Fervo Cape Geothermal Power Project (Project). In accordance with our responsibilities under Section 309 of the Clean Air Act (CAA) and Section 102(2)(C) of the National Environmental Policy Act (NEPA), we are providing comments that identify areas of the EA we recommend improving. The CAA Section 309 role is unique to EPA. It requires EPA to review and comment on the environmental impact of any proposed federal action subject to NEPA's environmental impact statement requirements and to make its comments public.

The EA proposes two alternatives: the No Action Alternative and the Proposed Action. The Project includes the development of approximately 23 well pads for drilling and completion of geothermal observation, production, and injection wells; up to 20 geothermal power plants; associated access roads; a power distribution network composed of sub-transmission lines, an electrical switchyard, and a general tie-in transmission line; a geothermal fluid pipeline gathering system; and ancillary facilities such as buildings and required tie-in upgrades. The proposed action includes the development of an estimated 320 geothermal production and injection wells. The developments proposed as part of the Project would be located on private lands, lands owned by Utah's State Institutional Trust Lands Authority (SITLA), and on federal public lands managed by the BLM. All proposed developments would be located on areas under geothermal resource lease. The maximum surface disturbance associated with the Project would be approximately 631 acres within the area of interest. Approximately 148 acres of that disturbance will occur on federally managed lands. The remaining acreages of disturbance will take place on privately held lands. The proposed Project would include the conversion of some of the exploration wells into production and injection wells, the construction of additional production, injection, and observation wells, the construction of additional access roads and utility lines, and connection to modular geothermal power plants.

FEC E&P Management LLC and Escalante Desert Resources LLC (EDR), together known as EDR, have obtained the rights, via geothermal lease agreements, to explore for and develop renewable geothermal resources. The BLM previously completed an EA (DOI-BLM-UT-C010-2023-0004-EA) analyzing the potential impacts associated with the proposed Cape Modern Geothermal Exploration Project. The BLM issued the Finding of No Significant Impact (FONSI) and Decision Record for the Cape Modern Geothermal Exploration Project on February 13, 2023. The Cape Modern Geothermal Exploration Project identified a commercially viable geothermal resource. Geothermal exploration work under the Exploration EA began in June 2023, resulting in the construction of well pads, water storage impoundments, and access roads. With this EA, EDR is proposing to construct, operate, and maintain the Project in Beaver County, Utah, with the intent to bring the identified geothermal resource to market.

The powerplants for this Project will use cutting-edge binary Organic Rankine Cycle systems (ORC) designed and built by Turboden (an Italian company owned by Mitsubishi Heavy Industries). An ORC system is a closed thermodynamic cycle used for production from low to medium-high temperature heat sources from 176-752 degrees Fahrenheit and for small-medium applications at any temperature level. ORC systems can help reduce the environmental impact of climate change by using low-grade heat from renewable energy sources.

The EPA supports the construction of environmentally sound geothermal developments to help achieve a carbon-free electricity sector no later than 2035, as envisioned in Executive (EO) 14008, "Tackling the Climate Crisis at Home and Abroad" (January 27, 2021). In our review of this EA, we have identified several issues for your attention, specifically air and water resources.

We appreciate the opportunity to provide comments on the Fervo Cape Geothermal Power Project. Our detailed comments are below. If you have questions or would like to discuss our comments, please contact me at (303) 312-6155 or mccoy.melissa@epa.gov, or Jody Ostendorf, Lead Reviewer for this project, at (303) 312-7814 or ostendorf.jody@epa.gov.

Sincerely,

Melissa W. McCoy, Ph.D., J.D.
Manager, NEPA Branch
Environmental Justice, Community Health, and
Environmental Review Division

Detailed Comments on the Fervo Geothermal Power Project EA

Air Resources

The EA does not include air resource impacts in the issues considered but eliminated from detailed analysis. Air quality is mentioned in Table 1-1, Relationship to Statues, Regulations, and Other Plans, with statements that "[p]roject activities would be required to adhere to all air quality standards set by the UDAQ," and that "Beaver County is currently in attainment with the National Ambient Air Quality Standards (NAAQS), and the short-term increase in fugitive dust and small amounts of equipment emissions are within state air quality standards, and … [t]he design features in Appendix D would limit fugitive dust, and any fixed generators would be permitted as required by state and local regulation through UDAQ and Beaver County."

The EA's statements about adherence to design features and permitting requirements does not substitute for an analysis of impacts under NEPA, and this approach lacks an evaluation of potential direct, indirect, and cumulative impacts related to project construction and development that will occur despite conformance with laws and design features. Without such an analysis, the statement that "the short-term increase in fugitive dust and small amounts of equipment emissions are within state air quality standards" is unsupported. Furthermore, we are aware of several near-field air quality impacts analyses conducted for projects in Wyoming, Montana, and the Dakotas that have projected air quality impacts from well drilling that approach or exceed the NAAQS and for which mitigation measures beyond what is currently included for this project (see Appendix D), such as Tier 4 drill rig engines, were determined to be appropriate. Therefore, we recommend carrying out an analysis of air quality impacts from project activities, including the drilling of 320 wells, as this is necessary to understand the impacts from this project and whether they could be significant, including in the context of impacts from other existing development projects in the area. We have provided a recommended framework for this analysis below.

Existing Air Quality and Air Quality Related Values (AQRVs)

We recommend characterizing the existing air quality baseline for criteria pollutants and AQRVs, including visibility and resources sensitive to deposition. For criteria pollutants, we recommend coordinating with the Utah Division of Air Quality (UDAQ) to establish representative design values (background pollutant concentrations) based on the most recent monitoring data for distinct airsheds in Utah that could be affected by all phases of the project. Data are also available to the public through the EPA's design values webpage, outdoor air monitor webpage, as well as through the EPA's Air Quality System (AQS) for AQS users.

We recommend characterizing trends in visibility within and near the planning areas, including sensitive areas identified in coordination with Federal Land Managers (FLMs). Data are available through the IMPROVE monitoring network as well as information prepared by the FLMs. We suggest working with the relevant FLMs and Tribes regarding existing AQRVs in the areas they manage. Information is also available online at:

- https://www.epa.gov/outdoor-air-quality-data/interactive-map-air-quality-monitors;
- http://vista.cira.colostate.edu/Improve/;
- https://www.nps.gov/subjects/air/park-conditions-trends.htm; and

- https://www.fs.usda.gov/air/technical/class_1/alpha.php.

Existing deposition may be characterized by utilizing the National Atmospheric Deposition Program (NADP) monitoring network in conjunction with total deposition (TDEP) estimates and information available from the FLMs and websites bulleted above. Areas that may be relevant include but are not limited to Bryce Canyon National Park and Capitol Reef National Park. As part of the characterization of existing conditions, we recommend also providing estimates of current emissions from any known emission sources in the area. These baseline emission inventories provide useful information regarding existing emissions in the area for criteria pollutants and Hazardous Air Pollutants (HAPs).

Air Quality and AQRV Impact Analysis

We recommend developing an emissions inventory for the geothermal power development activities that are planned for the project, based on a Plan of Operation or information requested of Fervo. These activities likely include, but are not limited to, drilling of wells, road construction, with associated fugitive dust, and the construction and operation of compression facilities which generate their own emissions and create reasonably foreseeable indirect and cumulative impacts associated with the project that should be explored in the NEPA document. We are available to work with the BLM on the approach for the air quality impact analysis after completing the emissions inventory for all phases of the project. Based on the level of projected emissions, existing emissions, proximity to sensitive areas, and input from other state and federal agencies, it may be appropriate to conduct additional analysis beyond the emissions inventory. We recommend that the BLM work with the EPA, FLMs, and state agencies to address the following analysis components: Impacts from each of the criteria pollutants (ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide, and lead), including with respect to their respective NAAQS; impacts to AQRVs in potentially impacted Class I areas; and impacts that could result from exposure to HAPs based on relevant health-based risk thresholds for HAPs. We are available to assist with methods of analysis, and appropriate characterization of available thresholds.

Technically Enhanced Naturally Occurring Radioactive Material

EPA has made the BLM aware of the potential for Technologically Enhanced Naturally Occurring Radioactive Material (TENORM). The EA states there is no known source of elevated Naturally Occurring Radioactive Materials (NORM) in the Project area, such as young marine shales or potassium-rich granitic bodies. BLM concludes exposure to NORM is not considered a concern. However, while there may not be elevated levels of NORM in the rock units in the Project area, NORM may be concentrated and relocated as a result of Project activities, creating a pathway for radiation exposure. The concentrated or relocated material is called TENORM. The workers who maintain and clean contaminated equipment are at risk of exposure to the TENORM. Therefore, we recommend the EA differentiate between NORM and TENORM and re-evaluate the risk for exposure to TENORM. To verify the potential for NORM and TENORM we recommend requiring verification sampling of the host formation and operational waters. If NORM in the host formation could present risks of exposure as TENORM, then we recommend including a stipulation which requires EDR to develop a radiological monitoring plan in order to reduce the possibility of exposure. If TENORM are anticipated, we

recommend the Final EA explain how TENORM in material and equipment will be isolated and disposed of, as well as ways in which the generation of TENORM could be reduced or avoided.

Water Resources

The BLM did not include water resources in the list of issues that were considered but eliminated from detailed analysis. EPA's research identified many intermittent and ephemeral streams in the Project area. The EA does not provide a map or evaluation of the many water resources in the project area, some of which may be permanently impacted by the siting of well pads and associated infrastructure. It is not clear from the EA how BLM will avoid, minimize and/or mitigate those impacts. In the table in Appendix C titled Resources and Issues Considered, the BLM states that there will be no impacts to water resources/quality for drinking/surface/groundwater. The EA does not provide a water resources analysis to support that conclusion, which is warranted considering that 631 acres of BLM and private surface will be disturbed, representing a 19.7% increase to past and present disturbance (Draft EA, p. 48) in the Project area, which is substantial. Of specific concern, there are well pads which appear to overlap with streams in the area. For example, proposed well pads in Sections 6, 5, and 8 of Township 27S 9W, Section 2 of Township 27S 10W, Section 26 of Township 26S 10W, and Sections 30 and 19 of Township 26S 9W appear to overlap with intermittent streams.

Intermittent and ephemeral streams may not have associated riparian areas, and do not always contain flowing water, but are important to protect because they perform a diversity of hydrologic, biochemical and geochemical functions that directly affect the integrity and functional condition of higher-order waters downstream. When functioning properly, these streams provide for the movement of water, nutrients, and sediment throughout the stream network; connectivity within the watershed, protection of downstream water quality through nutrient storage and cycling; stream energy dissipation during high-water flows to reduce erosion and improve water quality; surface and subsurface water storage and exchange; groundwater recharge and discharge; sediment transport, storage and deposition to aid in floodplain maintenance and development; wildlife habitat and migration corridor; support for vegetation communities to help stabilize stream banks and provide wildlife services and water supply and water quality filtering.[1] Considering these streams make up the majority of water resources in the arid and semi-arid west, a full analysis should consider these important functions when analyzing potential direct, indirect and cumulative impacts to the water resources in or near the Project area.

Activities associated with construction and operation of the Project, including placement of well pads and crossings of streams by roads and pipelines, have the potential to create substantial disturbance and hydrological effects and impact water resource function and surface water quality on a long-term basis. The EA does not detail any required setbacks between infrastructure such as well pads and Project area streams, which are well-documented measures that are important for protection of water resources. It is not even clear whether well pads may be constructed directly on top of ephemeral or intermittent streams, with corresponding direct impacts on the functions and values of those streams and associated watershed processes. In addition, road-stream crossings (which are not detailed in the EA) are one of the largest chronic inputs of eroded sediment to streams. Crossings can also cause large

[1] *See* https://www.epa.gov/sites/default/files/2015-03/documents/ephemeral_streams_report_final_508-kepner.pdf.

acute inputs of sediment when the hydraulic capacity of a culvert is exceeded during flood events or when the culvert is plugged, and not enough information is provided on the sizes or design of the planned culverts to make conclusions about the magnitude of potential effects.[2] The EA states that constructed access roads crossing existing drainages may require installation of culverts, but it is not clear under what criteria culverts would be constructed or not, and low-water crossings without culverts often route sediments directly into the channel and can contribute to stream bank and soil erosion and the introduction of soil and other pollutants into the stream when vehicles cross the channel.

Aside from the potential impacts to Project area streams through well pad, road, and other infrastructure construction and, there may also be effects of traffic and pollution such as road salt on watershed processes and habitat associated with the ephemeral streams. Development in hydrologically connected zones can also reduce the storm buffering capacity of a watershed, resulting in increased downstream flooding and stream channel erosion. Subsequently, these changes may also result in important biological consequences that can affect the entire ecosystem. The surface water resources Design Features, mostly related to stormwater control, are not a substitute for a full impacts analysis.

Cumulative Impacts

We could not find an explanation for why the Area of Interest defined for the EA is appropriate for bounding the area in which cumulative impacts should be considered. In general, impacts analyses should consider all areas that could be cumulatively impacted by a project. For example, it is not clear why there would not be cumulative impacts from the Project when added to other existing Beaver County developments such as the U.S. Department of Energy's $200 million Utah FORGE (Frontier Observatory for Research in Geothermal Energy) project, which is the nation's first enhanced geothermal system, PacifiCorp's Blundell plant, which is a conventional geothermal project fed by a hot spring, and solar farms and windmills surrounding the site. If some or all of these developments could affect the same water resource(s), the EPA recommends that the EA consider the direct, indirect, and cumulative impacts of the Project to geology, soils, and water resources when added to the impacts from these additional renewable energy developments.

Mitigation, BMPs, and Design Features

The EA discusses reserve pits and stormwater containment structures that would follow BMPs in the "Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development" (Gold Book) (Fourth Edition - Revised 2007). There are other BMPs and mitigation measures discussed in the EA for protection against native soil erosion, reclamation of disturbed areas, minimization of air pollution, and weed management. EPA is concerned that there are no Design Features in the EA that establish setback distances from aquatic resources, to mitigate water quality impacts. We recommend including such required setbacks in the Final EA. EPA also recommends that BLM identify which entity

[2] For example, even open-bottom culverts do not eliminate impacts to stream morphology, and the degree to which alterations to stream morphology are minimized would depend primarily on the size and placement of the culvert. Even with optimal size and placement, often the entrance and exit of the culverts will have armoring to try to keep the stream from shifting away from the culvert location and there would likely be some reduction in floodplain connectivity and in lateral migration of the channel through the culvert.

will be responsible for monitoring, oversight, and enforcement of the BMPs, Design Features, and Gold Book commitments.

Alternatives Analysis

Aside from the No Action alternative, the EA only offers one Alternative, the Proposed Action. A reasonable range of alternatives should include options for avoiding environmental impacts. The EA states, "No other alternatives were brought forward for detailed analysis as no other alternatives were identified that would meet the purpose and need" (Draft EA, p. 17) This does not explain how the proposed action is the only alternative that would meet the purpose and need. We recommend further considering if there could be alternative options for placement of well pads and other infrastructure that could meet the purpose and need while causing fewer environmental impacts (see, e.g., our comments above on the location of the proposed well pads where intermittent streams are present). Alternatively, please explain why there are no other options.

ePLANNING

Comment Submission

Project: DOI-BLM-UT-C010-2024-0018-EA - Fervo Cape Geothermal Power Project

Document: DRAFT_DOI-BLM-UT-C010-2024-0018-EA Fervo Production EA.pdf

Submission ID: FervProd-1-500714138

Comment

My kudos and gratitude to BLM for this highly informative and comprehensive EA.

I strongly support the proposed action alternative. Geothermal energy is very important to replace the use of fossil fuels that pollute and add to devastating climate change.

I hope this work is successful and sustainable.

Great thanks!

Submitter(s)

Submitter 1

Name: Utahn
Address: Not Provided
Group or Organization Name: Not Provided

Disclaimer

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment - including your personal identifying information - may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

(Withhold my personally identifying information from future publications on this project) - ***NO***

ePLANNING

Comment Submission

Project: DOI-BLM-UT-C010-2024-0018-EA - Fervo Cape Geothermal Power Project

Document: DRAFT_DOI-BLM-UT-C010-2024-0018-EA Fervo Production EA.pdf

Submission ID: FervProd-1-500714139

Comment

This is an excellent EA and worthwhile proposal. We need more geothermal for clean and renewable energy. Please keep up this positive work. Thank you.

Submitter(s)

Submitter 1

Name: Not Provided
Address: Not Provided
Group or Organization Name: Not Provided

Disclaimer

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment - including your personal identifying information - may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

(Withhold my personally identifying information from future publications on this project) - ***NO***

Congress of the United States
Washington, DC 20510

September 9, 2024

The Honorable Deb Haaland
Secretary
U.S. Department of the Interior
1849 C Street NW
Washington, D.C. 20240

Re: Fervo Cape Geothermal Power Project

Dear Secretary Haaland:

We write regarding the Environmental Assessment (EA) of the Fervo Cape Station Geothermal Power Project in Beaver County, Utah.[1] The Bureau of Land Management's (BLM) Cedar City Field Office, Color Country District, and Utah State Office worked hard to contribute to the February 2023 authorization of exploration activities for this project. In this subsequent EA, we urge BLM to consider the positive impacts of the Fervo Cape Station Project and approve its EA in an efficient and timely manner.

Enhanced geothermal systems (EGS) leverage the technological advances made in recent years by the oil and gas industry and implement them to develop reliable, emission-free energy. The Cape Station Project is the first greenfield utility-scale EGS project and will generate between 50 and 150 megawatts of power per month. In addition, the project is expected to create approximately 6,600 temporary jobs and 161 full-time jobs, contributing over $437 million in earned wages.

Throughout previous permitting processes, Fervo worked closely with the BLM Cedar City Field Office and conducted extensive engagement with the city, county, state, and non-governmental entities. As a result, six comments were submitted on the exploration activities EA – all in support of the project. Additionally, Fervo carefully selected the location of the Cape project to avoid any sensitive, historic, and cultural resources.

We appreciate the BLM taking the time to conduct a thorough, fair, and balanced EA process. EGS is a promising clean firm energy technology and, based on its record, Fervo has proven to be a trustworthy partner to the communities of southwest Utah. We urge the BLM to carefully consider the positive impacts of the Fervo Cape Station Project and to expeditiously approve the project's Environmental Assessment.

Sincerely,

[1] DOI-BLM-UT-C010-2024-0018-EA

Michael S. Lee
United States Senator

Mitt Romney
United States Senator

John Curtis
Member of Congress

Blake Moore
Member of Congress

Burgess Owens
Member of Congress

Celeste Maloy
Member of Congress

Cc: Laura Daniel-Davis, Acting Deputy Secretary, Department of the Interior
Dr. Steve Feldgus, Principal Deputy Assistant Secretary for Land and Minerals Management
Tracy Stone-Manning, Director, Bureau of Land Management
Brenda Mallory, Chair, White House Council on Environmental Quality
Ali Zaidi, Director, White House Climate Policy Office