

Task 1.3.7. Environmental Information Synopsis

Environmental Setting

The Utah FORGE site is adjacent to an operating 306 MW wind farm and a planned 240 MW solar PV plant in a broad, mostly flat, 5000+/- ft. elevation high desert valley of grass and shrub lands, some of which is used for cattle range. This generally rural area is bisected by highways, a rail line, major and minor power and gas pipeline utility corridors, and scattered small communities. Milford, Utah, is 16 miles east of the project site. The Roosevelt Hot Springs PacifiCorp Blundell geothermal power plant and a 500,000 hog farm and biogas operation are south of Milford.

Access to the Utah FORGE project site is year-round via existing county-maintained roads. Annual precipitation is about 12 inches, highest total monthly snowfall is about 3.5 inches (in December) and annual snowfall about 16 inches, significantly less than the Utah average. There are no potable aquifers and no surface waters in the project area. Groundwater is of poor quality but suitable for use in, and already secured for, the stimulation projects. The valley is still open for additional water appropriation.

In 2007-2008 a lightning-caused wildfire removed most plant habitat and the area was reseeded with indigenous grasses. Although no threatened or endangered species have been identified, there are some cross-country restrictions during nesting season for migratory birds. Biological and archeological surveys are planned to be conducted as part of the site inventory in Phase 2A.

NETL and the National Environmental Policy Act (NEPA)

NEPA review of the project is facilitated by the existing environmental data found in the 2011 multistate solar PEIS that includes the Milford area and in a 2008 EA for the wind farm adjacent to the proposed project site. BLM manages a majority of the lands in the project area and NEPA review will also benefit from the numerous BLM resource inventory and planning documents. See, at the minimum:

USDO I BLM Environmental Assessment UT-040-82973: Milford Wind Corridor Project, October 15, 2008. See:

http://www.blm.gov/style/medialib/blm/wo/MINERALS_REALTY_AND_RESOURCE_PROTECTION/energy/renewable_references.Par.95803.File.dat/Milford%20Wind%20Corridor%20Project%20EA%2010-14-08.pdf

EIS-0403: Draft (2011) and Final (2012) Programmatic Environmental Impact Statement Solar Energy Development in Six Southwestern States (AZ, CA, CO, NV, NM, and UT). See: energy.gov/nepa/downloads/eis-0403-final-programmatic-environmental-impact-statement

BLM 2013 Cedar City Field Office Resource Management Plan Analysis of the Management Situation. See: https://eplanning.blm.gov/epl-front-office/projects/lup/7100/56975/61666/CCFO_AMS_.pdf

Cedar City Field Office Resource Management Plan/Environmental Impact Statement: Analysis of the Management Situation, Appendix K Renewable Resources Report. See: https://eplanning.blm.gov/epl-front-office/projects/lup/7100/42769/45569/Appendix_K._Renewable_Resources_Report.pdf

The Utah FORGE Team recommends a national 3rd party environmental services firm familiar with the area and issues -- SWCA, with offices in Salt Lake City (or another firm acceptable to NETL) be contracted to assist in preparing the Environmental Inventory and the Environmental Assessment (EA).

The Utah FORGE team will provide a detailed project description and surface facilities layout, participate in scoping, provide project, geophysical and geochemical data, subcontract biological and cultural/archeological field surveys using professionals acceptable to NETL and coordinate with NEPA staff of US DOE NETL, US Bureau of Land Management, University of Utah EGI, and other cognizant Utah State agencies. The Utah FORGE Team will also respond to all information requests by the environmental firm, agencies and DOE and make team professionals available on subjects within their area of expertise. It is anticipated that lead and cooperating agency(ies) will be determined among the agencies or by NETL. NETL will provide NEPA contract oversight and review. The NEPA review will assist U.S. DOE in go/no-go decisions and the U.S. Bureau of Land Management (BLM) and Utah State Agencies in evaluating whether and with what stipulations/conditions to grant permits to the Utah FORGE Project to develop the proposed project facilities, in compliance with NEPA.

Best Management Practices and Standard Operating Procedures

Production and injection well drilling and operating best management practices (BMPs), standard operating procedures (SOPs) and waste management practices will be identified early in the Phase 2 planning, permitting and NEPA processes and implemented throughout. The Utah FORGE project will employ use of “Baker tanks” to handle drilling muds and produced fluids. Examples of reference sources for best management practices include but are not limited to mitigation measures cited in various geothermal EAs and the following resource documents and their cited references:

BLM’s Gold Book. See:

http://www.blm.gov/style/medialib/blm/wo/MINERALS_REALTY_AND_RESOURCE_PROTECTION_energy/oil_and_gas.Par.18714.File.dat/OILgas.pdf

BLM Winnemucca District Appendix B. Best Management Practices and Standard Operating Procedures. See

http://www.blm.gov/style/medialib/blm/nv/field_offices/winnemucca_field_office/rmp/0.Par.48614.File.dat/Volume5Part2ApxB.pdf

Handbook of Best Practices for Geothermal Drilling: John Finger and Doug Blankenship, Prepared for the International Energy Agency, Geothermal Implementing Agreement, Annex VII by Sandia National Laboratories. December 2010. See: *<http://www1.eere.energy.gov/geothermal/pdfs/drillinghandbook.pdf>*

Permits

The Utah FORGE Project team is fully versed in and will comply with all county, state and federal standards and permitting requirements, including collection of environmental baseline data, environmental review, stipulations/conditions of permits, mitigation processes, and reclamation activities following FORGE activities. The proposed Utah FORGE project has received enthusiastic support from landowners, the local community, the county and state officials. The status of preliminary discussions, applications and negotiations with agency and

landowner staff are shown in Table 1. The cost of the environmental permitting is estimated to be \$225,000. This includes the cost of environmental consultants, required surveys and efforts from the Utah FORGE team including data gathering, presentations, and travel. Monitoring, ongoing reporting and insurance/well bonds represent additional costs. We anticipate most of the permitting can be initiated in Phase 2A, although completion of NEPA may require most of Phase 2B (Table 2).

Table 1. Preliminary list of permits and access rights.

AGENCY/ENTITY	PERMIT/RIGHT	APPLIED FOR	ISSUED	REQUIRES NEPA
Utah State Lands	Use of Land/Subsurface			Yes
Murphy-Brown	Use of Land/Subsurface			Yes
BLM Cedar City	Temporary Water Pipeline	Yes		Yes
BLM Cedar City	Geophysical/Geological Surveys	Yes		No
BLM Cedar City	Vibroseis	Yes		Yes
BLM Cedar City	Rocky Mtn Power Line Extension Right of Way	No		Yes
BLM Cedar City	Right of Way, Fiber optics along road	No		Yes
Murphy-Brown	200 Acre Ft. Water Right	Yes	Yes	No
Utah Nat. Res. DWR	300 Acre Ft. Water Right	Yes		No
Utah Natural Res.	Geothermal Well Permits	No		Yes
Utah DEQ – Div. Water Qual (DWQ)	UIC – Underground Injection Control	No		EA will address
Utah DEQ – Div. Water Qual (DWQ)	Stormwater UPDES General Permit	No		EA will address
Utah DEQ – Div. Water Qual (DWQ)	Fuel/Other Flammable or Hazardous Material	Guidance offered		EA will address
Utah DEQ – Div. Water Qual (DWQ)	Groundwater Discharge Permit (to be determined)	No		EA will address
Beaver County Planning	Conditional Use Permit	No		EA will address
SW Utah Public Health Dept.	Sanitary Waste - Office Septic System	No		EA will address
Utah Dept. Heritage and Arts – SHPO	Historic/Cultural/Archeol. APE Map for Approval	No		EA will address
Rocky Mtn Power	Power Line Authorization	No		

Table 2. Permitting and EA schedule in months.

Finalize All 2A Tasks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Arch/Biol.Surveys & Rpt																	
Permits w/ DNA or Casual Use																	
Environ. Assessment																	
Permits w/ EA																	

Phase 2A = blue; Phase 2B = green.

BLM - U.S. Bureau of Land Management

Rights of Way, Permits and NEPA: Although the project site is on private lands, rights-of-way, Notices of Intent and other permits are required from the BLM authorizing use of the surface across BLM land for access to the site and siting of geophysical surveys, extension of a power line to the project, for the temporary surface pipeline from water wells to the project site, installation of a fiber optic line along existing roads and any other operations requiring temporary or permanent access across or use of BLM lands. Preliminary review of proposed operations by the BLM field office staff in Cedar City have identified no barriers to approval of project activities using BLM land (see BLM letter and attachments of April 19, 2016, Appendix 1.3.7).

DWO - Utah Department of Environmental Quality – Division of Water Quality

The Utah FORGE Project is in communication with the Utah Division of Water Quality regarding permitting of the following programs/activities.

- Underground Injection Control (UIC) Program
- Construction Stormwater Program
- Storage of Process Water in a Pond or Basin
- Discharge of Sanitary Waste
- Above Ground Storage of Diesel or Petroleum Products

UIC Permit: The Utah Division of Water Quality has granted the Utah Forge Project authorization-by rule status under the UIC Program provided we work with the UIC Program to develop conditions to share plans and data with the UIC Program (see October 2014 letter from Candace Cady in Appendix 1.3.7). The Utah Forge Project will provide all data necessary for the Utah Division of Water Quality to develop this list of conditions to be attached to the authorization by rule letter during phase 2 of the FORGE project.

Stormwater UPDES General Permit: Construction of the Utah FORGE Project facilities will disturb more than one acre of land surface and will require a Utah Pollutant Discharge Elimination System (UPDES) General Permit for Construction authorized through the Construction Stormwater Program. We will apply for a UPDES General Permit when facility plans are finalized during phase 2 of the FORGE project.

Surface Discharge: Preliminary plans are to use Baker Tanks for storage of process water. If the Utah FORGE Project requires storage of process water in ponds or basins, a groundwater discharge permit will need to be obtained from the Utah Division of Water Quality. The Utah FORGE Project will likely involve the storage of process water, but the locations, type of storage, and quantities of discharge are not yet known. If needed, we will apply for the groundwater discharge permit when storage and discharge information is available during phase 2 of the FORGE project.

Sanitary Waste – Septic System: The Utah Division of Water Quality requires that prior to discharge of sanitary waste, a septic tank system permit be obtained. Such a permit will be applied for through the Southwest Utah Public Health Department as soon as the Utah FORGE Project has been sited and designed, and the proposed location of the septic tank system and leachline drainfield is known. This will occur during phase 2 of the FORGE project.

Fuel and Other Flammable or Hazardous Material: The Utah Division of Water Quality would like to provide guidance regarding proper storage and containment of above ground diesel and petroleum products to minimize possible spill or loss of products. The Utah FORGE Project will communicate with the Utah Division of Water Quality as soon as the sites of any diesel or petroleum storage facilities associated with our project are known, prior to bringing such storage facilities to the site. Common mitigation measures can include, but not be limited to creating a berm a few inches high, or a trench of a few inches deep around fuel tanks and ensuring availability of onsite fire extinguishers, fire water tanks, and firefighting and safety equipment and including direction for handling of hazardous materials in a site safety plan.

Utah Department of Natural Resources – Division of Water Rights

Application to Appropriate Geothermal Water: The Utah Division of Water Rights (DWRi) administers the appropriation and distribution of the State's valuable water resources. The Utah Geological Survey on behalf of the Utah FORGE Project has already applied for and been granted water rights for 50 acre-feet per year of groundwater from seven points of diversion in the Black Rock District of Escalante Valley for geothermal purposes (see Order of the State Engineer for Fixed-Time Application Number 71-5373 in Appendix 1.3.7). Should the points of diversion change once well sites are more precisely located during phase 2 of the FORGE project, the Utah Geological Survey may need to file a change application.

Application to Drill Geothermal Wells: The DWRi regulates the drilling of geothermal wells in Utah under Utah Administrative Code Rule R655-1. During phase 2 of the FORGE project, before drilling any exploratory or production wells, the Utah FORGE Project is required to submit a plan of operations to the State Engineer for his approval. This plan shall include the following.

- Location, elevation and layout.
- Lease identification and Well Number.
- Tools and equipment description including maximum capacity and depth rating.
- Expected depth and geology.
- Drilling, mud, cementing and casing program.
- Blowout Prevention Equipment (BOPE) installation and test.
- Logging, coring and testing program.

- Methods for disposal of waste materials.
- Environmental considerations.
- Emergency procedures.
- Other information as the State Engineer may require.

Southwest Utah Public Health Department

Utah regulations require that all wastewater be disposed to an approved sewer or onsite wastewater (septic) system. Southwest Utah Public Health Department environmental health professionals will assist the Utah FORGE Project in applying for a septic system permit, answering questions or concerns throughout the construction process, and maintaining the project's system in proper working condition (<http://swuhealth.org/utah-septic-systems/>).

The Utah FORGE Project must perform soil and percolation tests before designing a septic system and completing a Septic System Application to the Southwest Utah Public Health Department. Utah regulations require that certified individuals or engineers perform soil testing and design septic systems. The Utah FORGE Project will do this work during Phase 2C of the FORGE project, when an office building will be constructed.

Utah Department of Heritage and Arts – State Historic Preservation Office

In addition to the federal cultural and archeological regulations, Utah law requires state agencies and developers using state funds to take into account how their expenditures or undertakings will affect historical and archaeological properties. Written evaluation of the project and an opportunity to comment must be provided to the State Historic Preservation Officer (SHPO). Although there are no historical sites in the area surrounding the Utah FORGE Project site, there are archaeological sites (see September 2014 letter from Lori Hunsaker in Appendix 1.3.7). However, the BLM field office in Cedar City has indicated that there are no known cultural sites where the Utah FORGE Project has proposed activities. A cultural/archeological field survey and report by qualified professionals will be obtained in communication with SHPO during Phase 2, preceded by submission to SHPO of an Area of Potential Effect (APE) map.

Beaver County

Conditional Use Permit: The Utah FORGE Project will be required to obtain a Conditional Use Permit (CUP) from Beaver County for the drilling portion of the project during phase 2 of the FORGE project (see October 2015 emails from Scott Albrecht in Appendix 1.3.7). The entire scope of work will likely be permitted through one CUP, and the process will likely be completed in 6 weeks. As a condition of the CUP, a road maintenance agreement (RMA) between Beaver County and the Utah FORGE Project will need to be adopted. This agreement will state that Beaver County will perform regular maintenance and that the Utah FORGE Project will be responsible for any damages caused as a direct result of a negligent act by the project.

Building Permit: Beaver County will require the Utah FORGE Project to obtain a building permit for temporary offices. If the Utah FORGE Project offices are going to be in place for more than 1 year, Beaver County requires they have a permanent foundation.

Encroachment Permit/Easement Water Line: The Utah FORGE Project may run a temporary water line parallel to Salt Cove Road. Most of the roads in Beaver County do not have a written deed or right-of-way and instead these roads have prescriptive easements. Historically Beaver County has only claimed the disturbed area as the county's prescriptive easement. This easement would include some shoulder area for maintenance purposes. Beaver County is willing to work with the Utah FORGE Project to place a water line on the shoulder or in the Salt Cove Road (see October 2015 email exchanges from Scott Albrecht in Appendix 1.3.7).

Rocky Mountain Power

The Utah FORGE project will work with Rocky Mountain Power, BLM and Beaver County to determine the requirements for extending a power line to the project area. An initial cost estimate including a visit with a Rocky Mountain Power estimator (Kent Sorenson, Cedar City office) during April 2016 suggested a cost of about \$600,000. The per mile cost for above-ground transmission (480 V, 200 amps) is about \$84,000 per mile, with underground transmission being double this cost. The proposed line of 6.5 miles will cross the UPR rail line and a 345 kV transmission line. Rocky Mountain Power has a "blue-sky" program that allows the user to pay 1.9c/kWh extra to ensure renewable power generation in the consumed power. Compliance with the requirements of the above listed regulatory agencies will ensure that the Utah FORGE Project uses the appropriate environmental best practices. Additionally, the Utah FORGE Project has developed a Hazardous Waste Contingency Plan (see chapter 1.3.2. Environmental, Safety and Health Plan) that will ensure best waste management practices. Once locations of well and building sites are finalized during phase 2 of the FORGE project, reclamation plans will be developed to restore all disturbances caused by the Utah FORGE Project to natural conditions.