

3.17 HAZARDOUS MATERIALS/WASTE AND SOLID WASTE

For purposes of this section, we are concerned with *hazardous materials*, *hazardous substances*, *hazardous waste*, and *solid waste*. *Hazardous materials* is the most generic and inclusive term. It has been defined as any substance that, due to quantity, concentration, physical, chemical, or infectious characteristic, may present substantial danger to public health, welfare, or the environment when released. The term includes *hazardous substances* and *hazardous waste*. Examples of hazardous materials include petroleum, natural gas, synthetic gas, toxic chemicals, and low-level radioactive sources.

Hazardous substances are identified and regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).²⁶ *Hazardous substances* as defined in 40 CFR §373.4 refer to the group of substances defined as hazardous under CERCLA 101(14), and appear in the reference's Table 302.4. The elements, compounds, and hazardous wastes appearing in Table 302.4 are designated as *listed hazardous substances* under section 102(a) of CERCLA. *Hazardous substances* also include unlisted solid wastes that exhibit characteristics of ignitability, corrosivity, reactivity, or toxicity. The term *hazardous substance* does not include petroleum, crude oil, or are fraction of crude oil unless it is specifically listed or designated, and the term does not include natural gas or synthetic gas useable as fuel (40 CFR 300.5).

Hazardous wastes are identified and regulated under the Resource Conservation and Recovery Act (RCRA).²⁷ Hazardous wastes are defined as solid wastes that exhibit one or more of the characteristics of ignitability, corrosivity, toxicity, or reactivity, or are listed as a hazardous waste in 40 CFR Part 261 Subpart D. *Solid wastes* that are not hazardous by the RCRA definition, normally referred to simply as "solid wastes," are basically any relatively benign materials that are discarded. Solid wastes can include domestic or industrial refuse, vegetative debris from land clearing, discarded construction materials, drill cuttings, and some of the materials used for drilling and plugging wells. Sewage sludge is not a solid waste.

3.17.1 Affected Environment

Hazardous materials, hazardous waste, and solid waste are not normally considered to be part of the natural environment. These items are, rather, the result of human intrusion into the natural environment. In this PEA is concerned only with hazardous materials, hazardous waste, and solid waste used or generated by exploration and development activities resulting from leasing under the Proposed Action.

²⁶ Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (P.L. 96-510) as amended by the Superfund Amendments and Reauthorization Act (SARA) Title III of 1986 (P.L. 99-499) and the Community Environmental Response Facilitation Act of 1992 (P.L. 102-426)

²⁷ Resource Conservation and Recovery Act (RCRA) of 1976 (P.L. 94-580 (42 USC §6901))

3.17.2 Environmental Impacts

3.17.2.1 Proposed Action

Direct Impacts – There are no direct impacts from issuing leases for future geothermal exploration, development, and production activities.

Indirect Impacts – When considering the “reasonably foreseeable development scenario,” impacts would be insignificant if the substances described in section 3.17.2 are properly handled, stored, and disposed. Proper management of these substances according to Federal and State regulations would ensure that no soil, groundwater, or surface water contamination would occur with any adverse effects on wildlife, worker health and safety, or surrounding communities. Proper management (in accordance with Federal (RCRA, SARA,²⁸ SWDA,²⁹ OSHA,³⁰ EPCRA,³¹ etc.) and State regulations) of these substances would ensure no contamination of soil, groundwater, and surface water, which could also have an impact on wildlife, worker health and safety, and the surrounding community. Under this alternative this updated PEA would permit inclusion of updated stipulations, mitigation measures, and/or performance standards specific to each lease that would ensure the long-term health of the area’s environmental quality.

The following are environmental impacts from hazardous materials, hazardous waste, and solid waste, which might be encountered in the "reasonably foreseeable development scenarios.

Exploration. Impacts could include drilling fluid or hydrocarbon spills, leakage from improperly constructed sump pond or wastewater collection systems, improperly handled briny water from drilling, and accumulations of solid waste which could impact water quality or contaminate soils. Hydrocarbon spills could be hydraulic fluid, gasoline, oil, or grease from vehicles, generators, and exploratory drill rigs. Briny water from exploratory drilling, if improperly disposed, could raise the pH of existing surface waters to hazardous levels. Accumulations of non-hazardous waste solids and liquids could include trash, drill cuttings, wastewater, bentonite, and cement generated during drilling operations.

Development. Impacts would be the same as in the exploration phase, but the quantities of hazardous materials, hazardous waste, or solid waste used and generated could be greater. In addition, stormwater runoff could contain elevated quantities of heavy metals and volatile organic compounds. Substantial quantities of non-hazardous solid waste and liquids could be generated at this stage, increasing the potential for contamination of water, soil, and possible toxic impacts to wildlife.

Production. Impacts of the long-term production phase could include spills and leaks from routine plant operations. Some of the involved materials could be hydraulic fluid, gasoline, oil,

²⁸ Superfund Amendments and Reauthorization Act (SARA) of 1986

²⁹ Solid Waste Disposal Act (SWDA) of 1965 (P.L. 89-272m Title II, as amended by P.L. 94-580)

³⁰ Occupational Safety and Health Act (OSHA) of 1970 (P.L. 91-596, as amended; 29 CFR §1926.58)

³¹ Emergency Planning and Community Right to Know Act (EPCRA) of 1986 (42 USC Chapter 116, §11001 *et seq.*)

paint, antifreeze, cleaning solvents, transformer insulating fluid, binary fluids, and grease; these discharges could result in adverse impacts to water, soil, air, and wildlife. Accidental releases from sumps or wastewater collection systems could include hazardous water-treatment chemicals such as chlorine. Stormwater runoff containing excess heavy metals and volatile organic compounds could be a problem. There would likely be substantial quantities of non-hazardous solid waste generated.

Binary geothermal operations could use hazardous materials that are highly explosive and could have impacts to public safety, and increase the potential for wild fires.

Close-Out. Site personnel would identify, remove, and properly dispose all hazardous materials, hazardous waste, and solid waste. Spills could occur during the removal operation.

Based on meeting regulatory requirements and implementing leasing stipulations, adverse impacts from hazardous materials would be minor.

3.17.2.2 No Action Alternative

Direct Impacts – There are no direct impacts to issuing leases for future geothermal exploration, development, and production activities.

Indirect Impacts – Indirect impacts from the No Action Alternative would be similar to those described in the Proposed Action; however, updated mitigation measures and stipulations would not apply using the 1982 Geothermal EA.