



## Petroleum and geothermal energy safety information sheet

### FAQs on regulatory requirements for managing safety associated with geothermal energy exploration, drilling and recovery

#### *Introduction*

Geothermal energy activities in Western Australia are required to operate under a safety management system (SMS) designed to protect the occupational safety and health of the workforce.

This information sheet, in the form of frequently asked questions (FAQs), aims to assist industry to understand some of the main requirements under the Petroleum and Geothermal Energy Resources (Occupational Safety and Health) Regulations 2010 and Petroleum and Geothermal Energy Resources (Management of Safety) Regulations 2010.

*Note: This document is for guidance only and the definitive statutory requirements are contained in the Petroleum and Geothermal Energy Resources Act 1967 and associated regulations.*

#### *FAQs*

##### **Q. Do I need to seek approval for any geothermal recovery activities?**

**A.** Yes. All geothermal energy exploration, drilling, development and recovery activities require approval from the Department of Mines and Petroleum unless specifically excluded by application of the *Petroleum and Geothermal Energy Resources Act 1967*. Depending on the activity, a permit or licence will be required.

The Minister must accept the SMS for a proposed activity, unless specifically excluded, before that activity may proceed.

*Note: References to the Minister throughout this information sheet should be taken to mean the delegated office (i.e. Executive Director or Director Petroleum Safety, Resources Safety).*

##### **Q. What is an exclusion?**

**A.** Exclusions for geothermal energy recovery apply if the activity:

- is carried out for the purposes of a small-scale ground-source heat pump, such as used to heat and cool private domestic dwellings; or
- involves small-scale recovery of geothermal energy not for a commercial purpose.

*Note: For further information on the exclusions, refer to Section 7(4), Part 2 of the Petroleum and Geothermal Energy Resources Act 1967.*

##### **Q. What is a “commercial” operation?**

**A.** To be operating for a “commercial” purpose, the following factors would need to apply:

- separate legal entity (i.e. a natural person is not a separate legal entity);
- able to yield or make a profit;
- suitable or fit for a wide, popular market; and
- suitable for or catering to business rather than private use.

Examples of “non-commercial purposes” include:

- not-for-profit research;

- charity;
- personal use; and
- teaching functions.

#### **Q. Do I need to obtain confirmation of an exclusion?**

**A.** Yes. Confirmation of what is *not* “commercial” must be sought in writing at all times. The only exceptions to this are:

- the use of small-scale ground-source heat pumps where vertical drilling is purely for domestic home systems; or
- where no drill rig is required on site, such as installing a horizontal ground-coupled heat exchanger as part of an energy recovery ventilation system for personal use.

*Note: Collective geothermal heating and cooling systems, such as those for an office or apartment block, would be considered commercial as the system requirements are suitable for a wide market.*

#### **Q. Apart from drill rigs used for installing domestic systems, are there any other exclusions?**

**A.** No. Approval must be sought in all other circumstances, regardless of drill rig or operation size and type.

#### **Q. What other requirements need to be fulfilled before an approval can be granted?**

**A.** The Act calls for the applicant to demonstrate how they will fulfil their obligations and duties to ensure the occupational safety and health of persons engaged in a geothermal energy activity, and the safety of other protected persons (e.g. visitors), as well as maintaining the operation’s integrity.

The Petroleum and Geothermal Energy Resources (Management of Safety) Regulations 2010 call for an acceptable SMS, which must include a documented emergency response plan.

#### **Q. What is a safety management system?**

**A.** An SMS is a documented system for managing the safety and health of people involved in the activities to be performed and other protected people such as visitors to an operation, facility or site location. An SMS commonly comprises two documents:

- a safety manual; and
- an emergency response plan.

The documents should be commensurate with the size, scope, complexity and risk profile of the project. The aim is to demonstrate that the systems in place are appropriate to:

- eliminate or reduce to as low as reasonably practicable (ALARP) the risk of an incident; and
- fulfil duty of care obligations, responsibilities and duties under the Act to persons engaged in the operation and other protected persons such as visitors to the work site location.

When more than one party is involved, such as when an additional well is to be drilled either in or close to a production facility, a third document may be required. This is a bridging document addressing the interface between the safety and emergency response manuals of the parties involved (e.g. operator, drilling contractor) when two or more SMSs are in force at one location.

These documents should demonstrate that:

- decision, command and communication arrangements are clear to all parties involved for normal operational activities and emergencies, and potential conflicts have been addressed;
- site-specific hazards will be managed; and
- potential incidents will have an appropriate, coordinated and efficient response from all parties.

*Note: If exploration drilling is successful and commercial exploitation of geothermal energy will proceed then additional approvals are required regarding design validation, construction and operation.*

**Q. I have or am developing an SMS and emergency response plan, but these have not been submitted to the Minister for acceptance. May I commence activities on the work site before submission to the Minister, or while I am waiting for submission acceptance?**

**A.** No. Under regulation 5 of the Petroleum and Geothermal Energy Resources (Management of Safety) Regulations 2010, it is an offence for a “person” to engage in activities without an accepted SMS in force for the operation, unless specifically excluded by the Act. A fine can be applied per day from the time the offence was deemed to occur.

*Note: “SMS in force” is defined as an SMS or revised SMS that has been accepted by the Minister.*

**Q. Is there an ongoing requirement for an SMS once the drill rig has left the site?**

**A.** Yes. However, geothermal operations have a lower risk potential of an major accident event compared to hydrocarbons, so once the drill rig has left a site, the SMS requirements are confined to:

- the wellhead, plant and equipment (such as heat exchanger); and
- supply and re-injection lines contained in the primary circuit (closed loop) only.

A practical example of how this works would be a commercial public swimming pool complex, where the legislative requirements would only apply from the wellhead and the lines running up to, and including, the pump, heat exchanger, and return line for re-injection. Areas such as the main and learner’s pools, recreational areas, café and rest rooms remain under the jurisdiction of existing regulatory bodies.

The same principle applies to much larger facilities, such as a binary cycle plant for power generation, where the wellheads, plant equipment, and supply and re-injection lines containing the “primary” fluid will be covered by the *Petroleum and Geothermal Energy Resources Act 1967*, and everything else (e.g. “secondary” circuit working fluid, turbines, generators) will be administered by other regulatory bodies, such as WorkSafe or EnergySafety.

*Note: “Working fluid,” “primary” and “secondary” in this context relate to heat from the geothermal fluid (primary fluid or circuit) being transferred to a lower boiling point fluid (secondary circuit or working fluid), which is vaporised and used to drive a turbine or generator.*