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GEOHERMAL ENERGY—QUESTIONS AND ANSWERS

WHAT IS GEOTHERMAL ENERGY?

Geothermal energy is the heat of the earth's interior. This heat deep within the earth is generated by radioactive decay and is conducted through the rocks of the earth's crust to the surface, where the heat slowly escapes. At the places where molten rock is cooling near the earth's surface, the escape of heat may be much greater than normal. Man is attempting to harness this energy and utilize it as a source of power.

WHAT FORMS DOES GEOTHERMAL ENERGY TAKE AND HOW IS IT MANIFESTED AT THE EARTH'S SURFACE?

Over most of the earth's surface the temperature in the earth's crust increases slowly with depth—at an average rate of about 1 degree Fahrenheit per 100 feet. Under these conditions the escape of heat from the surface can be detected only by sensitive instruments, and there are no visible signs of geothermal energy.

In a few areas, such as hot springs or the oceanic ridge systems, where igneous rocks (rocks formed by solidification from a molten or partly molten magma) are cooling and fairly near the earth's surface, the temperature increases rapidly with depth. Within the earth, circulating ground water may absorb the escaping heat and reach temperatures that exceed the boiling point. This can result in surface manifestations such as geysers, hot springs and pools, or vents where hot gases escape into the atmosphere. Here, the surface of the earth is often warm or even hot to the touch.

WHAT GEOLOGIC CONDITIONS ARE NECESSARY FOR THE EXISTENCE OF A GEOTHERMAL FIELD?

There are four geologic requirements for a geothermal field. These are:

1. A source of heat, usually a cooling igneous rock.
2. A reservoir rock with high porosity and permeability (ability to hold and transmit large quantities of fluid).
3. A cap rock that is impermeable to keep the hot geothermal fluids from escaping.
4. A source for recharge of the reservoir. Recharge is usually accomplished by percolation of ground water into the geothermal reservoir.