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## Standard Terminology Relating to Geothermal Energy<sup>1</sup>

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**aquifer**, *n*—a water-bearing, permeable body of rock or granular material below the surface of the earth.

**binary cycle plant**, *n*—a facility that generates electric power by transferring heat from produced geothermal fluids to a non-aqueous working fluid that vaporizes and causes a turbine to rotate the shaft of a generator.

**brine**, *n*—in geothermal, fluids in a liquid phase that have been produced from geothermal wells or from hot springs and that contain appreciable amounts of sodium chloride and other salts.

**capacity**, *n*—the power which a component of a geothermal facility (for example, a well, a reservoir, a power plant, or a direct-use facility) is capable of supplying at a point in time, assuming that other required components of the geothermal facility are available. Capacity is expressed in units of power (for example, megawatts, kilowatts).

**direct-use facility**, *n*—a facility which uses geothermal energy for purposes other than the generation of electricity (for example, space heating, greenhouses, bathing, and industrial processes).

**fumarole**, *n*—a vent at the earth's surface that emits steam or gaseous vapor.

DISCUSSION—Such vents are usually found in volcanic areas.

**geochemistry**, *n*—the study of the chemistry of the rocks and fluids of the earth for the purpose of understanding their composition, their temperature, and their origin.

**geothermal**, *adj*—relating to or derived from the natural heat of the earth.

**geothermal anomaly**, *n*—a conspicuous deviation of the earth's temperature, geothermal gradient, or heat flow from average values; an area where such a deviation exists.

**geothermal energy**, *n*—the thermal energy contained in the rocks and fluids of the earth.

**geothermal facility**, *n*—the physical components necessary for the utilization of geothermal energy, including the reservoir, production and injection wells, pipelines, and the power plant or direct-use facility.

**geothermal fluid**, *n*—water in a vapor or liquid phase or in a mixture of these phases that exists within or has been emitted from a geothermal reservoir, together with any entrained or dissolved substances.

**geothermal gradient**, *n*—the change in temperature of the earth with depth, expressed either in degrees of temperature per unit depth, or units of depth per degree.

**geothermal power plant**, *n*—a facility for the production of electricity using geothermal energy, typically including a turbine, a generator, and associated surface equipment.

**geothermal heat pump**, *n*—a heat pump that transfers energy to or from the earth.

**geothermal reserves**, *n*—the amount of energy anticipated to be economically recoverable from a geothermal facility over a specified time period (for example, the project life) using existing technology. Geothermal reserves are expressed in units of energy (for example, terajoules in SI units), which are dimensionally equivalent to units of power multiplied by units of time (for example, megawatt-years or kilowatt-hours). Geothermal reserves may also be expressed as an equivalent amount of another energy source (for example, barrels of oil equivalent).

DISCUSSION—Geothermal reserves can also be characterized as to the degree of certainty of recovery. By analogy to usage in the mining and petroleum industries, reserves may be qualified as proven, probable, or possible.

Example of usage:

This facility has geothermal reserves of 4,000 megawatt-years, recoverable over a project life of 30 years.

**geothermal reservoir**, *n*—an aquifer of sufficient temperature and permeability to support the economic use of geothermal energy.

DISCUSSION—The extent of a geothermal reservoir is determined by the degree of hydrologic interconnection. When an aquifer contains both hot portions and portions that are too cool for economic use, those portions that are sufficiently interconnected to have a significant hydrologic or thermal impact on each other are considered part of the same geothermal reservoir.

<sup>1</sup> This terminology is under the jurisdiction of ASTM Committee E44 on Solar, Geothermal and Other Alternative Energy Sources and is the direct responsibility of Subcommittee E44.01 on Terminology and Editorial.

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