

8. GLOSSARY

accident An unplanned sequence of events that results in undesirable consequences.

adsorption The attraction and adhesion of ions or molecules in a gaseous or aqueous state to a solid surface.

air pollutant Any substance, including but not limited to, dust, fumes, gas, mist, odor, smoke, vapor, pollen, soot, carbon, or particulate matter that is regulated.

air quality The general condition of the air resources, usually expressed in terms of attainment of ambient air quality standards.

air quality concentration The specific measurement (or estimate) in the ambient air of a particular air pollutant at any given time.

air quality criteria Regulatory limits of air pollutants in ambient air, designated by varying amounts of pollution and lengths of exposure, designed to limit the potential for specific adverse effects to health and welfare (see air quality standard).

air quality standard The prescribed level of a pollutant in the outside air that cannot be exceeded during a specified time in a specified geographical area. Established by both federal and state governments (see air quality criteria).

ambient air Any unconfined portion of the atmosphere: open air, surrounding air. The portion of the atmosphere outside of buildings to which the general public has access.

attainment area Any area which is designated, pursuant to 42 United States Code (USC) Section 7407(d) of the *Clean Air Act*, as having ambient concentrations of equal to or less than national primary or secondary ambient air quality standards for a particular air pollutant or air pollutants.

baseline A quantitative expression of conditions, costs, schedule, or technical progress which serves as a base or standard for measurement; the established plan against which the status of resources and the progress of a program can be measured.

Best Available Control Technology (BACT) An emission standard (including fuel cleaning or treatment or innovative fuel combination techniques) for control of contaminants required to be included in PSD Permits. BACT shall be determined on a case-by-case basis, taking into account energy, environmental and economic impacts, and other costs, and shall be at least as stringent as any applicable Sections of 40 *Code of Federal Regulations* (CFR) Part 60 and 40 CFR Part 61. If an emissions standard is infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed as BACT.

calorific A chemistry term relating to heat production.

capacity The maximum load a generator, turbine, power plant, transmission circuit, or power system can supply under specified conditions for a given period of time without exceeding approved limits of temperature and stress.

Clean Coal Technology Program The Clean Coal Technology (CCT) Program was implemented in 1986 to allow for a number of advanced, more efficient, reliable, and environmentally responsive coal utilization and environmental control technologies to become available to the U.S. energy marketplace. The projects under the CCT Program potentially demonstrate cost-effective CCTs that are capable of being commercialized. The CCT

Program's main goal is to achieve significant long-term reductions in sulfur dioxide and nitrogen oxide emissions from coal burning and industrial facilities by providing federal funds for projects that will demonstrate new efficient and environmentally-safe coal technologies.

coal fines Small particles and dust from coal, usually less than 200 mesh.

combined cycle The type of generating plant that burns fuel to generate electricity in a turbine connected to one generator and recovers waste heat to produce steam which powers another generator.

combustion turbine A rotary engine that converts the energy in a stream of liquid or gas into mechanical energy by passing the steam through a system of fixed and moving fanlike blades and causing the latter to rotate. The rotating blades are connected to a generator of electrical energy.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) A federal law (also known as "Superfund") that provides a comprehensive framework to deal with past or abandoned hazardous materials. CERCLA provides for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment that could endanger public health, welfare, or the environment, as well as the cleanup of inactive hazardous waste disposal sites. CERCLA has jurisdiction over any release or threatened release of any "hazardous substance" to the environment. Under CERCLA, the definition of "hazardous" is much broader than under the *Resource Conservation and Recovery Act*, and the hazardous substance need not be a waste. If a site meets the CERCLA requirements for designation, it is ranked along with other "Superfund" sites and listed on the National Priorities List. This ranking and listing is the Environmental Protection Agency's (EPA) way of determining which sites have the highest priority for cleanup.

criteria pollutants Pollutants for which national primary or national primary and secondary ambient air quality standards have been defined under Section 109 of the *Clean Air Act* to protect human health and welfare.

diffusion The process by which a pollutant plume is diluted by turbulent eddies.

discharge Under principles of hydrogeology, the amount of water passing through (or leaving) a given cross-sectional area in a given period of time. Under the *Clean Water Act*, discharge of a pollutant includes any addition of any pollutant or combination of pollutants to waters of the United States from any source point. This definition includes additions of pollutants into waters of the United States from surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or person which do not lead to a treatment works; and discharges through pipes, sewers, or other conveyances, leading into privately-owned treatment works.

dispersion In air pollution, the process of transport and diffusion of airborne contaminants in the atmosphere.

DOE Orders Requirements internal to the U.S. Department of Energy (DOE) that establish DOE policy and procedures, including those for compliance with applicable laws.

emission (air) Any controlled or uncontrolled release or discharge into the outdoor atmosphere of any air pollutants or combination thereof. Emission also includes any release or discharge of any air pollutant from a stack, vent, or other means into the outdoor atmosphere that originates from an emission unit.

endangered species Animals, birds, fish, plants, or other living organisms threatened with extinction by manmade changes in their environment. Requirements for declaring a species endangered are contained in the *Endangered Species Act*.

endothermic A chemistry term meaning characterized by or formed with the absorption of heat.

Environmental Information Volume (EIV) A collection of data provided by the Industrial Partner prior to preparation of an Environmental Impact Statement (EIS).

exothermic A chemistry term meaning characterized by or formed with the release of heat.

fault A surface or zone of rock fractures along which there has been displacement.

feed hopper Equipment that provides continuous feed of coal and limestone to a gasifier through a coal feeder.

floodplains Highwater channels of rivers, streams, and lakes that may be covered with water on a seasonal or episodic basis.

fugitive dust Dust that is stirred up and released into the atmosphere whether during construction activities or ongoing facility operations. Fugitive emissions composed of particulate matter.

fugitive emissions Material such as coal dust that escapes from conveyors and handling equipment.

gasifier The vessel in which coal is processed into gas.

gasification The process of converting a liquid or a solid (e.g., coal) to a gas.

geology The scientific study of the origin, history, structure, and processes of the earth.

groundwater Generally, all water contained in the ground. Water held below the water table available to freely enter wells.

hazardous air pollutant Any air pollutant subject to a standard promulgated under 42 USC Section 7412 or other requirements established under 42 USC Section 7412 of the *Clean Air Act*, including 42 USC Section 7412(g), (j), and (r) of the *Clean Air Act*.

hazardous chemical A term defined under the *Occupational Safety and Health Act* and the *Emergency Planning and Community Right to Know Act* as any chemical that is a physical hazard or a health hazard.

hazardous material A substance or material, including a hazardous substance, which has been determined by the U.S. Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce.

hazardous substance Any substance that when released to the environment in an uncontrolled or unpermitted fashion becomes subject to the reporting and possible response provisions of the *Clean Water Act* and CERCLA.

hydrocarbons One of a very large group of chemical compounds composed only of carbon and hydrogen; the largest source is from petroleum crude oil.

Inhalable particulate matter (PM₁₀) suspended aerosols and solid particles with an aerodynamic equivalent diameter that is generally less than 50 microns. The “10” in PM₁₀ is not a size limit; it is the size range collected with 50 percent efficiency by certified PM₁₀ samplers. PM₁₀ samplers have size-dependent collection efficiencies, collecting more than 50 percent of the ambient particles having aerodynamic equivalent diameters of less than 10

microns, and collecting less than 50 percent of the ambient particles having aerodynamic equivalent diameters larger than 10 microns.

integrated gasification combined cycle A generating plant employing both coal gasification and combined-cycle power generation.

isotherm A line representing all points of equal temperature.

kilovolt (kV) A measure of electrical potential difference equal to 1,000 volts.

kilowatt (kW) A measure of electrical power equal to 1,000 watts.

kilowatt-hour (kWh) A common unit of electric energy consumption. Power (measured in kilowatts) multiplied by the time of operation (measured in hours) equals kilowatt-hours.

megawatt (MW) A measure of electrical power equal to one million watts.

megawatt-hour (Mwh) A measure of electrical energy equal to one megawatt of power supplied from an electric circuit for one hour.

mitigation Those actions that avoid, minimize, rectify, reduce or eliminate, or compensate for the impact.

National Ambient Air Quality Standards (NAAQS) Air quality concentration standards established by EPA, under the *Clean Air Act*, to protect public health and welfare.

National Environmental Policy Act of 1969 (NEPA) A law that requires federal agencies to include in their decisionmaking processes appropriate and careful consideration of all potential environmental effects of proposed actions, analyses of their alternatives, and measures to avoid or minimize adverse effects of a proposed action that have the potential for significantly affecting the environment. These analyses are presented in either an environmental assessment or in an EIS.

nitrogen oxides (NO_x) A product of combustion of fossil fuels whose production increases with the temperature of the process. Under certain conditions, emissions of nitrogen oxides contribute to the formation of acid rain, particulate matter, and photochemical smog.

nonattainment areas Under the *Clean Air Act*, areas of the United States designated by EPA in which violation of one or more air quality standards for criteria pollutants is occurring.

particulates Fine liquid or solid particles such as dust, smoke, mist, fumes, or smog found in air contaminants.

peak The greatest amount of demand occurring during a specified period of time.

peaking Generating units that operate only during system peaks or during emergencies, usually less than 20 percent of the hours in a year.

Prevention of Significant Deterioration (PSD) An EPA program in which state and/or federal permits are required that restrict emissions to BACT limits for new and modified sources in areas where air quality is in compliance with National Ambient Air Quality Standards.

prime farmland Land having the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, without intolerable soil erosions.

Reactive Organic Compounds Organic compounds that are undergoing chemical reactions in the presence of sunlight and nitrogen oxides, resulting in the formation of ozone, particulate matter, and other components of photochemical smog.

seismicity The phenomenon of earth movements; seismic activity. Seismicity is related to the location, size, and rate of occurrence of earthquakes.

stoichiometric A chemistry term meaning relating to a branch of chemistry called stoichiometry. Stoichiometry is a branch of chemistry that deals with the application of the laws of definite proportions and of the conservation of mass and energy to chemical activity. A stoichiometric reaction is one in which the proportions of the reactants are held at certain levels, and the temperature and pressure is regulated to achieve a desired result.

sulfur dioxide (SO₂) Compound composed of sulfur and oxygen produced by the burning of sulfur and its compounds in coal, oil, and gas. It is harmful to the health of man, plants, and animals, and may cause damage to materials.

surface water All waters naturally open to the atmosphere including rivers, lakes, reservoirs, streams, impoundments, seas, estuaries.

topography The physical features of a surface area including relative elevations, and the position of natural and man-made features.

tuyeres A nozzle through which an air blast is delivered to a forge or furnace. The tuyeres in the gasifier unit are the injection points for oxygen gas, steam, and the tar and oil condensate streams.

Vitrified frit (or vitreous frit) a glassy, silica-like matrix produced in the water quench portion of the gasification process. All metals contained in the fuel feeds would be retained within the matrix of the frit upon exiting the gasifier. The frit could potentially be marketed for use in areas such as in construction as road aggregate.

watershed The surface drainage area and subsurface soils and geologic formations that drain to a particular body of water.

watt (W) A basic unit of electric power. One watt is equal to 0.00134 horsepower or 0.73756 foot-pounds per second (the energy necessary to move one pound the distance of 0.73756 feet in one second).

wetland An area that is regularly saturated by surface or groundwater and subsequently is characterized by a prevalence of vegetation that is adapted for life in saturated soil conditions.

