
Glossary

- 25 Year, 24 Hour Storm Event:** The rainfall event with a probable recurrence interval of once in 25 years with a duration of 24 hours, as defined by the National Weather Service in technical Paper Number 40, "Rainfall Frequency Atlas of the United States:", May 1961, and subsequent amendments.
- Aerobic Bacteria:** Bacteria that require free elemental oxygen to sustain life.
- Aerobic:** Requiring, or not destroyed by, the presence of free elemental oxygen.
- AgSTAR:** A voluntary federal program that encourages the use of effective technologies to capture methane gas, generated from the decomposition of animal manure, for use as an energy resource.
- Ally:** Companies in the agricultural and energy industries that assist AgSTAR Partners by developing and distributing up-to-date technology for methane recovery systems.
- Anaerobic:** Requiring, or not destroyed by, the absence of air or free oxygen.
- Anaerobic Bacteria:** Bacteria that only grow in the absence of free elemental oxygen.
- Anaerobic Lagoon:** A treatment or stabilization process that involves retention under anaerobic conditions.
- Anaerobic:** A tank or other vessel for the decomposition of organic matter in the absence of elemental oxygen.
- Anaerobic Digestion:** The degradation of organic matter including manure brought about through the action of microorganisms in the absence of elemental oxygen.
- Bacteria:** A group of universally distributed and essentially unicellular microscopic organisms lacking chlorophyll.
- Barn:** A totally or partially enclosed structure where animals are confined.
- Best Management Practice (BMP):** A practice or combination of practices found to be the most effective, practicable (including economic and institutional considerations) means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals.
- Biogas:** Gas resulting from the decomposition of organic matter under anaerobic conditions. The principal constituents are methane and carbon dioxide.
- Biomass:** Plant materials and animal wastes used especially as a source of fuel.
- Boar:** An uncastrated male pig.
- British Thermal Unit (BTU):** The amount of heat required to raise the temperature of one pound of water one degree Fahrenheit. One cubic foot of biogas typically contains about 600 to 800 BTUs of heat energy. By comparison, one cubic foot of natural gas contains about 1,000 BTUs.
- Bull:** A mature (approximately 24 months of age or older) uncastrated male dairy or beef animal.
- Calf:** An immature dairy or beef animal up to approximately six months of age.
- Carbohydrates:** Any of various compounds of carbons, hydrogen, and oxygen (e.g., sugars, starches, and celluloses), which are generally formed by green plants. Carbohydrates are a principal source of energy in animal feeds and are excreted if not utilized.
- Complete Mix Digester:** A controlled temperature, constant volume, mechanically mixed vessel designed to maximize biological treatment, methane production, and odor control as part of a manure management facility with methane recovery.

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<i>Composting:</i>	The biological decomposition and stabilization of organic matter under conditions which allow the development of elevated temperatures as the result of biologically produced heat. When complete, the final product is sufficiently stable for storage and application to land without adverse environmental effects.
<i>Confine:</i>	A confinement facility for swine animals.
<i>Cover Fraction:</i>	The fraction of the lagoon (0-100%) that is covered by an impermeable gas- and air-tight cover.
<i>Covered Lagoon Digester:</i>	An anaerobic lagoon fitted with an impermeable, gas- and air-tight cover designed to capture biogas resulting from the decomposition of manure.
<i>Cow:</i>	A mature female dairy or beef animal that has produced at least one calf.
<i>Cow-Dry:</i>	A mature cow in the period between the cessation of lactation and calving.
<i>Cow-Lac:</i>	A lactating dairy or beef cow.
<i>Dairy-Drylot:</i>	A dairy farm where cows are confined and fed in an open lot, also called a corral or paddock in some regions.
<i>Dairy-Free Stall:</i>	A dairy farm where cows are confined in a totally or partially enclosed structure but are not confined in individual stalls.
<i>Dairy-Tie Stall:</i>	A dairy farm where cows are confined in a totally or partially enclosed structure and are confined in individual stalls.
<i>Dairy-Stand-Alone-Heifer:</i>	A dairy operation that specializes in raising calves as dairy cow replacements.
<i>DDB Depreciation:</i>	Double declining balance (DDB) depreciation is an accelerated depreciation method in which first year depreciation is double the amount of straight-line depreciation.
<i>Demand charge:</i>	The peak kW demand during any quarter hour interval multiplied by the demand charge rate.
<i>Digester:</i>	A concrete vessel used for the biological, physical, or chemical breakdown of livestock and poultry manure.
<i>Discount rate:</i>	The interest rate used to convert future payments into present values.
<i>Down payment:</i>	The initial amount paid at the time of purchase or construction expressed as a percent of the total initial cost.
<i>Drylot:</i>	An enclosed, unpaved area where the animals can move about freely and where they can feed along a feed apron.
<i>Drystack:</i>	Solid or dry manure that is scraped from a barn, feedlane, drylot or other similar surface and stored in a pile until it can be utilized.
<i>Effluent:</i>	The discharge from an anaerobic digester or other manure stabilization process.
<i>Endorsers:</i>	Professional and trade associations, colleges and universities, institutions, and societies who support AgSTAR and encourage the use of renewable energy sources.
<i>Energy Charge:</i>	The energy charge rate times the total kWh of electricity used.
<i>Facultative:</i>	Living, active, or occurring in the presence or absence of free oxygen.
<i>Facultative Bacteria:</i>	Bacteria living in the presence or absence of free oxygen. Facultative bacteria are important in the decomposition of manure.

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<i>FarmWare:</i>	A computerized decision support system that allows the evaluation of the costs and benefits of AgSTAR methane recovery systems.
<i>Fats:</i>	Any of numerous compounds of carbon, hydrogen, and oxygen that are glycerides of fatty acids, the chief constituents of plant and animal fat, and a major class of energy-rich food. "Fats are a principal source of energy in animal feeds and are excreted if not utilized."
<i>Feed Apron:</i>	A paved or hard surface along one side of a drylot where feed is provided to the animals.
<i>Feeder Pig:</i>	A pig from about 60 pounds to market weight.
<i>Finisher:</i>	A swine animal finished for market.
<i>Fixed Film Digester:</i>	An anaerobic digester in which the microorganisms responsible for waste stabilization and biogas production are attached to some inert medium.
<i>Flushing System:</i>	A manure collection system that collects and transports manure using water.
<i>Freeboard:</i>	The distance between the highest possible wastewater level in a manure storage/treatment structure and the top of the structure. Freeboard is an important design parameter in designing lagoons, ponds, storage basins, digesters, and other manure storage and treatment structures.
<i>Gilt:</i>	A female swine that has not produced pigs and has not reached an evident stage of pregnancy.
<i>Greenhouse Gas:</i>	An atmospheric gas, which is transparent to incoming solar radiation but absorbs the infrared radiation emitted by the Earth's surface. The principal greenhouse gases are carbon dioxide, methane, and CFCs.
<i>Grower:</i>	An immature male or female swine animal managed between weaning and finishing weights.
<i>Heifer:</i>	A female dairy or beef animal that has not produced a calf.
<i>Hydraulic Retention Time (HRT):</i>	The average length of time any particle of manure remains in a manure treatment or storage structure. The HRT is an important design parameter for treatment lagoons, covered lagoon digesters, complete mix digesters, and plug flow digesters.
<i>Inflation Rate:</i>	The annual rate of increase in costs or sales prices in percent.
<i>Influent:</i>	The flow into an anaerobic digester or other manure stabilization process.
<i>Internal Rate of Return (IRR):</i>	The discount rate that makes the NPV of an income stream equal to zero.
<i>Kilowatt (kW):</i>	One thousand watts (1.341 horsepower).
<i>Kilowatt Hour (kWh):</i>	A unit of work or energy equal to that expended by one kilowatt in one hour or to 3.6 million joules. A unit of work or energy equal to that expended by one kilowatt in one hour (1.341 horsepower-hours).
<i>Lagoon:</i>	Any large holding or detention pond, usually with earthen dikes, used to contain wastewater while sedimentation and biological treatment or stabilization occur.
<i>Land Application:</i>	Application of manure to land for reuse of the nutrients and organic matter for their fertilizer value.
<i>Liquid Manure</i>	Manure having a total solids content of no more than five percent.

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<i>Loading Rate:</i>	A measure of the rate of volatile solids (VS) entry into a manure management facility with methane recovery. Loading rate is often expressed as pounds of VS/1000 cubic feet.
<i>Loan Rate:</i>	The percent of the total loan amount paid per year.
<i>Manure:</i>	The fecal and urinary excretions of livestock and poultry.
<i>Marginal Tax Rate:</i>	The percent of the methane recovery project net income to be paid in taxes.
<i>Memorandum of Understanding (MOU):</i>	An agreement between AgSTAR Partners, Allies, and Endorsers and the EPA stating the responsibilities and commitments agreed to by both parties.
<i>Mesophilic:</i>	Operationally between 80°F and 100°F (27°C and 38°C).
<i>Methane:</i>	A colorless, odorless, flammable gaseous hydrocarbon that is a product of the decomposition of organic mater. Methane is a major greenhouse gas. Methane is also the principal component of natural gas.
<i>Methane Project Lifetime:</i>	The period of time during which the project is installed and completely paid for.
<i>Methane Recovery Lagoon:</i>	See covered lagoon digester.
<i>Minimum Treatment Volume:</i>	The minimum volume necessary for the design HRT or loading rate.
<i>Mix Tank:</i>	A control point where manure is collected and added to water or dry manure to achieve the required solids content for a complete mix or plug flow digester.
<i>Natural Gas:</i>	A combustible mixture of methane and other hydrocarbons used chiefly as a fuel.
<i>Net Present Value (NPV):</i>	The present value of all cash inflows and outflows of a project at a given discount rate over the life of the project.
<i>Nonpoint Source Pollution:</i>	Pollution resulting from intermittent discharges of pollutants from diffuse sources and is in transit over land before entering a water body.
<i>NPV Payback:</i>	The number of years it takes to pay back the capital cost of a project calculated with discounted future revenues and costs. Profitable projects will have an NPV Payback value less than or equal to the lifetime of the project.
<i>Nursery:</i>	An immature male or female swine animal managed between birth and growing/finishing.
<i>Nursery Pig:</i>	A weaned pig up to about 60 pounds live weight.
<i>Nutrients:</i>	A substance required for plant or animal growth. The primary nutrients required by plants are nitrogen, phosphorus, and potassium. The primary nutrients required by animals are carbohydrates, fats, and proteins.
<i>Operating Volume:</i>	The volume of the lagoon needed to hold and treat the manure influent and the rain-evap volume.
<i>Parlor:</i>	Facility where lactating cows are managed before, during, and after milking.
<i>Partner:</i>	A livestock producer who signs a Memorandum of Understanding (MOU) with the U.S. EPA and agrees to survey his/her facility and install methane recovery systems where profitable within 3 years.
<i>Pasture:</i>	An open area where the animals may roam freely.

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<i>Payback Years:</i>	The number of years it takes to pay back the capital cost of a project.
<i>pH:</i>	A measure of acidity or alkalinity. The pH scale ranges from zero to 14, with a value of 7 considered neutral. The lower a value, the higher the acidity, and the higher the value, the higher the alkalinity.
<i>Piglet:</i>	A nursing pig.
<i>Plug Flow Digester:</i>	A constant volume, flow-through, controlled temperature biological treatment unit designed to maximize biological treatment, methane production, and odor control as part of a manure management facility with methane recovery.
<i>Point Source Pollution:</i>	Pollution entering a water body from a discrete conveyance such as a pipe or ditch.
<i>Process Water:</i>	Water used in the normal operation of a livestock farm. Process water includes all sources of water that may need to be managed in the farm's manure management system.
<i>Proteins:</i>	Any of numerous naturally occurring extremely complex combinations of amino acids containing the elements carbon, hydrogen, nitrogen, and oxygen. Proteins in animal feeds are utilized for growth, reproduction, and lactation and are excreted if not utilized.
<i>Psychrophilic:</i>	Operationally between 54°F and 64°F (12°C and 18°C).
<i>Pull Plug Pit:</i>	A series of one or more pits where manure is collected until it is utilized or transferred to a storage or treatment structure.
<i>Rain-Evap Volume:</i>	The volume of the lagoon needed to hold the average rainfall on the surface and any watershed runoff minus the average evaporation at the surface.
<i>Scrape System:</i>	Collection method that uses a mechanical or other device to regularly remove manure from barns, confine buildings, drylots, or other similar areas where manure is deposited.
<i>Separator:</i>	A mechanical device or gravity settling basin that separates manure into solid and liquid fractions.
<i>Settling Basin:</i>	A basin designed to separate solid and fibrous material in the manure from the liquid portion.
<i>Sideslope:</i>	The slope of a lagoon embankment, often expressed as the ratio of the horizontal displacement and vertical displacement.
<i>Simple Payback:</i>	The number of years it takes to pay back the capital cost of a project calculated without discounting future revenues or costs.
<i>Sludge Volume:</i>	Volume to allow for sludge accumulation in a manure storage or treatment structure. Sludge volume is an important design parameter for manure storage and treatment structures.
<i>Slurry (Semi-solid) Manure:</i>	Manure having a total solids content between five and ten percent.
<i>Solids Manure</i>	Manure having a total solids content exceeding 10 percent.
<i>Sow:</i>	A female pig that has produced at least one litter of piglets.
<i>Storage Pond:</i>	An earthen basin designed to store manure and wastewater until it can be utilized. Storage ponds are not designed to treat manure.
<i>Storage Tank:</i>	A concrete or metal tank designed to store manure and wastewater until it can be utilized. Storage tanks are not designed to treat manure.

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<i>Storm Runoff:</i>	Manure contaminated rainfall which must be stored and utilized on the farm and may not be discharged into rivers, streams, lakes, or other bodies of water.
<i>Straight-Line Depreciation:</i>	Depreciation per year equals the total facility cost divided by the years of depreciation (usually the facility lifetime).
<i>Supplemental Heat:</i>	Heat added to complete mix and plug-flow digesters to maintain a constant operating temperature to increase rates of waste stabilization and biogas production.
<i>Swine-Farrow-to-Finish:</i>	A swine operation where pigs are raised from birth to market weight.
<i>Swine-Farrow-to-Nursery:</i>	A swine operation where pigs are raised from birth to weaning.
<i>Swine-Farrow-to-Feeder:</i>	A swine operation where pigs are raised from birth to approximately 60 pounds live weight.
<i>Swine-Grow/Finish:</i>	A swine operation where feeder pigs are fed to market weight.
<i>Supplemental Heat:</i>	Additional heat added to complete mix and plug flow digester to maintain a constant operating temperature at which maximum biological treatment may occur.
<i>SYD Depreciation:</i>	Sum of Years' Digits (SYD) is a common accelerated depreciation method where the sum of the digits is the total of the numbers representing the years of depreciation (usually the facility lifetime).
<i>Thermophilic:</i>	Operationally between 110°F and 140°F (43°C and 60°C).
<i>Total Solids:</i>	The sum of dissolved and suspended solids usually expressed as a concentration or percentage on a wet basis.
<i>Utility Interconnection:</i>	The method of utilizing electricity produced from manure management facilities. Options include either (1) on farm first use then sale to utility or (2) sale to the utility then direct purchase.
<i>Volatile Solids:</i>	The fraction of total solids that is comprised primarily of organic matter.
<i>Volatilization:</i>	The loss of a dissolved gas, such as ammonia, from solution.
<i>Volumetric Loading Rate:</i>	The rate of addition per unit of system volume per unit time. Usually expressed as pounds of volatile solids per 1,000 cubic feet per day for biogas production systems.
<i>Watershed:</i>	A facility of berms, channels, or other devices to collect and hold manure contaminated runoff for up to a 25yr-24 hr storm event.
<i>Withdrawal Schedule:</i>	The fraction of the treated manure and water effluent that is withdrawn from the effluent storage facility each month.