



TOWN OF WAREHAM

Water Pollution Control Facility

6 Tony's Lane Wareham, MA 02571

Vocabulary Sheet

There are various wastewater terms, abbreviations and symbols used in the industry that you can find on this document for a better understanding of the wastewater process, contract wordings, and more wastewater related matters.

>Greater Than

< Less Than

1) Accountability

- When a manager gives power/responsibility to an employee, the employee ensures the manager is informed of results or events.

2) Activated Sludge

- Sludge Particles produced in raw or settled wastewater (primary effluent) by the growth of organisms in aeration tanks in the presence of dissolved oxygen. The term "Activated" comes from the fact that the particles are teeming with bacteria, fungi, and protozoa. Activated Sludge is different from primary sludge in that the sludge particles contain many living organisms that can feed on the incoming wastewater.

3) Activated Sludge Process

- A biological wastewater treatment process that speeds up the decomposition of wastes in the wastewater being treated. Activated sludge is added to wastewater and the mixture (mixed liquor) is aerated and agitated. After some time in the aeration tank, the activated sludge is allowed to settle out by sedimentation and is disposed of (wasted) or reused (returned to the aeration tank) as needed. The remaining wastewater undergoes more treatment.

4) Acute Health Effect

- An adverse effect on a human or animal body, with symptoms developing rapidly.

5) Aeration

- The process of adding air to water. Air can be added to water by either passing air through water or passing water through air.

6) Aeration Liquor

- Mixed Liquor. The contents of the aeration tank, including living organisms and material carried into the tank either by untreated wastewater or primary effluent.

7) Aeration Tank

- The tank where raw or settled wastewater is mixed with return sludge and aerated. The same as aeration bay, aerator, or reactor.

8) Aerobic

- A condition in which atmospheric or dissolved oxygen is present in the aquatic (water) environment.



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9) Aerobic Bacteria

- Bacteria that will live and reproduce only in an environment containing oxygen that is available for their respiration (breathing), namely atmospheric oxygen and oxygen dissolved in water. Oxygen combined chemically, such as water molecules (H₂O), cannot be used for respiration by aerobic bacteria.

10) Aerobic Decomposition

- The decay or breaking down of organic material in the presence of free or dissolved oxygen.

11) Aerobic Digestion

- The breakdown of wastes by microorganisms in the presence of dissolved oxygen. This digestion process may be used to treat only waste activated sludge, primary (raw) sludge, or waste sludge from activated sludge treatment plants designed without primary settling. The sludge to be treated is placed in a large aeration tank where aerobic microorganisms decompose the organic material in the sludge. This is an extension of the activated sludge process.

12) Aerobic Process

- A waste treatment process conducted under aerobic (in the presence of free or dissolved oxygen) conditions.

13) Air Lift Pump

- A special type of pump consisting of a vertical riser pipe submerged in the wastewater or sludge to be pumped. Compressed air is injected into a tail piece at the bottom of the pipe. Fine air bubbles mix with the wastewater or sludge to form a mixture lighter than the surrounding water, which causes the mixture to rise in the discharge pipe to the outlet.

14) Algae

- Microscopic plants containing chlorophyll that live floating or suspended in water. They also may be attached to structures, rocks, or other submerged surfaces. Excess algae growth can impart tastes and odors to potable water. Algae produce oxygen during sunlight hours and use oxygen during the night hours. Their biological activities appreciably affect the pH, alkalinity, and dissolved oxygen of the water.

15) Alkalinity

- The capacity of water or wastewater to neutralize acids. The capacity is caused by the water's content of carbonate, bicarbonate, hydroxide and occasionally borate, silicate, and phosphate. Alkalinity is expressed in milligrams per liter (mg/L) of equivalent calcium carbonate. Alkalinity is not the same as pH because the water does not need to be strongly basic (high pH) to have a high alkalinity. Alkalinity is a measure of how much acid must be added to a liquor to lower the pH to 4.5.



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16) Anaerobes

- Bacteria that do not need dissolved oxygen (DO) to survive.

17) Anaerobic

- A condition in which atmospheric or dissolved oxygen (DO) is not present in the aquatic (water) environment.

18) Anaerobic Bacteria

- Bacteria that live and reproduce in an environment containing no free or dissolved oxygen. Anaerobic bacteria obtain their oxygen by breaking down chemical compounds that contain oxygen, such as sulfate.

19) Anaerobic Digestion

- A treatment process in which wastewater solids (about 5% solids, 95% wastewater) are placed in a large tank (the digester) where bacteria decompose the solids in the absence of dissolved oxygen.

20) Anoxic

- A condition in which the aquatic (water) environment does not contain dissolved oxygen (DO), which is called an oxygen deficient condition. Generally refers to an environment in which chemically bonded oxygen, such as nitrate, is present. This term is similar to Anaerobic.

21) B.O.D

- Biochemical Oxygen Demand. The rate at which organisms use the oxygen in the water or wastewater while stabilizing decomposable organic material under aerobic conditions. In decomposition, organic matter serves as food for the bacteria and energy results from its oxidation. BOD measurements are used as a surrogate to measure the organic strength of wastes in the water.

22) Backflow

- A reverse flow condition, created by a difference in water pressure that causes water to back flow into the distribution pipes of a potable water supply from any source or sources other than an intended source.

23) Bacteria

- Bacteria are living organisms, microscopic in size, that usually consist of a single cell. Most bacteria use organic matter for their food and produce waste products as a result of their life process.

24) Biochemical Oxygen Demand (BOD) Test

- A procedure that measures the rate of oxygen use under controlled conditions of time and temperature. Standard test conditions include dark incubation at 20°C for a specified time (usually five (5) days).



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25) Biodegradable

- Organic matter that can be broken down by bacteria to more stable forms that will not create a nuisance or give off foul odors is considered biodegradable.

26) Biomonitoring

- A term used to describe methods of evaluating or measuring the effects of toxic substances in effluents on aquatic organisms in receiving waters. There are two types of biomonitoring: Bioassay and Biosurvey.

27) Biosolids

- A primarily organic solid product produced by wastewater treatment processes that can be beneficially recycled. The word biosolids is replacing the word sludge when referring to treated wastes.

28) CFR

- Code of Federal Regulations. A publication of the US government that contains all of the proposed and finalized federal regulations, including safety and environmental regulations.

29) Carcinogen

- Any substance that tends to cause cancer in an organism

30) Certified Operator

- A person who has the education and experience required to operate a specific class of treatment facility as indicated by possessing a certificate of professional competence given by a state agency or professional associate.

31) Chain of Custody

- A record of each person involved in the handling and possession of a sample from the person who collected the sample to the person who analyzed the sample in the laboratory and to the person who witnessed the disposal of the sample.

32) Clarification

- Any process or combination of processes the main purpose of which is to reduce the concentration of suspended matter in a liquid.

33) Clarifier

- A tank or basin in which water or wastewater is held for a period of time during which the heavier solids settle to the bottom and the lighter materials float to the surface.

34) Colloids

- Very small, finely divided solids (particles that do not dissolve) that remain dispersed in a liquid for a long time due to their small size and electrical charge. (When most of the particles in the water have a negative electrical charge, they tend to repel each other. This repulsion prevents the particles from clumping together, becoming heavier, and settling out.



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35) Combined Sewer

- A sewer designed to carry both sanitary wastewaters and storm water runoff.

36) Composite Sample

- A composite sample is a collection of individual samples obtained at regular intervals, usually once every one (1) or two (2) hours during a 24 hour time span. Each individual sample is combined with the others in proportion to the rate of flow when the sample was collected. Equal volume individual samples also may be collected at intervals after a specific volume of flow passes the sampling point or after equal time intervals, and still be referred to as a composite sample. The resulting mixture (composite sample) forms a representative sample and is analyzed to determine the average conditions during the sampling period.

37) Confined Space

- A confined space means a space that:
 - ◆ Is large enough and so configured that an employee can bodily enter and perform assigned work.
 - ◆ Has limited or restricted means for entry or exit (examples: manholes, tanks, vessels, storage bins and vaults).
 - ◆ Is not designed for continuous employee occupancy.

38) Cross Connection

- A connection between drinking (potable) water and an unapproved water supply.
- A connection between a storm drain system and a sanitary collection system.
- Less frequently used to mean a connection between two sections of a collection system to handle anticipated overloads of one system.

39) D.O

- Dissolved Oxygen. D.O is the molecular oxygen dissolved in water or wastewater.

40) Debt Service

- The amount of money required annually to pay the (1) interest on outstanding debts, or (2) funds due on a maturing bonded debt or the redemption of bonds.

41) Denitrification

- The anoxic biological reduction of nitrate nitrogen to nitrogen gas.
- The removal of some nitrogen from a system.
- An anoxic process that occurs when nitrate or nitrite ions are reduced to nitrogen gas and nitrogen bubbles are formed as a result of this process. The bubbles attach to the biological floc and float the floc to the surface of the secondary clarifiers. This condition is often the cause of rising sludge observed in secondary clarifiers or gravity thickeners.



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42) Dewater

- To remove or separate a portion of the water present in a sludge or slurry. To dry sludge so it can be disposed of.
- To remove or drain the water from a tank or trench. A structure may be dewatered so that it can be inspected or repaired.

43) Diaphragm Pump

- A pump in which a flexible diaphragm, generally of rubber or equally flexible material, is the operating part. It is fastened at the edges in a vertical cylinder. When the diaphragm is raised, the suction is exerted, and when it is depressed, the liquid is forced through a discharge valve.

44) Diffuser

- A device (porous plate, tube, bag) used to break the air stream from the blower system into fine bubbles in an aeration tank or reactor

45) Digester

- A tank in which sludge is placed to allow decomposition by microorganisms. Digestion may occur under anaerobic (more common) or aerobic conditions.

46) Disinfection

- The process designed to kill or inactivate most microorganisms in water or wastewater, including essentially pathogenic (disease-causing) bacteria.

47) Distributor

- The rotating mechanism that distributes the wastewater evenly over the surface of a trickling filter or other process unit.

48) Effluent

- Water or other liquid- raw (untreated), partially treated, or completely treated- flowing from a reservoir, basin, treatment process, or treatment plant.

49) Enzymes

- Organic substances (produced by living organisms) that cause or speed up chemical reactions. Organic catalysts and/or biochemical catalysts.

50) Filamentous

- Organisms that grow in a thread or filamentous form. A common cause of sludge bulking in the activated sludge process. Common types are *Thiothrix* and *Actinomyces*.

51) Fixed Sample

- A sample is fixed in the field by adding chemicals that prevent the water quality indicators of interest in the sample from changing before final measurements are performed later in the laboratory.



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52) Floc

- Clumps of bacteria and particles or coagulants and impurities that have come together to form a cluster. Found in aeration tanks, secondary clarifiers, and chemical precipitation processes.

53) Flocculation

- The gathering together of fine particles after coagulation to form larger particles by a process of gentle mixing. This clumping together makes it easier to separate the solids from the water by settling, skimming, draining or filtering.

54) Force Main

- A pipe that carries wastewater under pressure from the discharge side of a pump to a point of gravity flow downstream.

55) Free Oxygen

- Molecular oxygen available for respiration by organisms.

56) GIS

- (Geographical Information System). A computer program that combines mapping with detailed information about the physical locations of structures, such as pipes, valves, and manholes, within geographical areas. The system is used to help operators and maintenance personnel locate utility system features or structures to assist with the scheduling and performance of maintenance activities.

57) Grab Sample

- A single sample of water collected at a particular time and place that represents the composition of the water only at that time and place.

58) Grit

- The heavy material present in wastewater such as sand, coffee grounds, eggs, gravel, and cinders. Also called detritus.

59) Grit Chamber

- A detention chamber or an enlargement of a collection line designed to reduce the velocity of flow of the liquid to permit the separation of mineral solids from organic solids by differential sedimentation.

60) Grit Channel

- An enlargement in a collection line where grit can easily settle out of the flow.
- The waterway of a grit chamber.

61) Grit Removal

- Grit Removal is accomplished by providing an enlarged channel or chamber that causes the flow velocity to be reduced and allows the heavier grit to settle to the bottom of the channel where it can be removed.



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62) Grit Tank

- A structure located at the inlet to a treatment plant for the accumulation of grit removal.

63) Headworks

- The facilities where wastewater enters a wastewater treatment plant. The headwork's may consists of bar screens, comminutors, a wet well and pumps.

64) Hepatitis

- Inflammation of the liver caused by an acute viral infection. Yellow jaundice is one of the symptoms of hepatitis.

65) Hydrogen Sulfide Gas (H₂S)

- Hydrogen Sulfide is a gas with a rotten egg odor, produced under anaerobic conditions. Hydrogen Sulfide Gas is particularly dangerous because it dulls the sense of smell, becoming unnoticeable after you have been around it for a while. In high concentrations it is only noticeable for a short time before it dulls the sense of smell. The gas is very poisonous to the respiratory system, explosive, flammable, colorless, and heavier than air.

66) Incinerator

- The conversion of dewatered wastewater solids by combustion (burning) to ash, carbon dioxide and water vapor.

67) Infiltration

- The seepage of groundwater into a sewer system, including service connections. Seepage frequently occurs through defective or cracked pipes, pipe joints and connections, interceptor access risers and covers, or manhole walls.

68) Inflow

- Water discharged into a sewer system and service connections from sources other than regular connections.
- This includes flow from yard drains, foundations, and around access and manhole covers.
- Inflow differs from infiltration in that it is a direct discharge into the sewer rather than a leak into the sewer itself.

69) Influent

- Water or other liquid- raw (untreated) or partially treated flowing into a reservoir, basin, treatment process, or treatment plant.

70) Inorganic Waste

- Waste material such as sand, salt, iron, calcium and other mineral materials that are only slightly affected by the action of organisms. Inorganic wastes are also chemical substances or mineral origin; whereas organic wastes are chemical substances usually of animal or plant origin.



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71) Main Sewer

- A sewer line that receives wastewater from many tributary branches and sewer lines and serves as an outlet for a large territory or is used to feed an intercepting sewer.

72) Materials Safety Data Sheet (MSDS)

- A document that provides pertinent information and a profile of particular hazardous substances or mixture. An MSDS is usually developed by the manufacturer or formulator of the hazardous substance or mixture. The MSDS is required to be made available to employees and operators or inspectors whenever there is a likelihood a hazardous substance or mixture is being introduced in the workplace.

73) Microorganisms

- Very small organisms that can only be seen through a microscope. Some microorganisms use the wastes in wastewater for food and remove much of the undesirable material.

74) Mixed Liquor

- When the activated sludge in an aeration tank is mixed with primary effluent of the raw wastewater and return sludge, this mixture is then referred to as mixed liquor as long as it is in the aeration tank.

75) NPDES Permit (National Pollutant Discharge Elimination System)

- The regulatory agency document issued either by a federal or state agency that is designed to control all discharges of potential pollutants from point sources and storm water runoff into US waterways. NPDES Permits regulate discharges into US waterways from all point sources of pollution including industries, municipal wastewater treatment plants, sanitary landfills, large animal feedlots, and return irrigation flows.

76) Nitrification

- An aerobic process in which bacteria change the ammonia and organic nitrogen in wastewater into oxidized nitrogen (usually nitrate). The second-stage BOD is sometimes referred to as "nitrogenous BOD" (first-stage BOD is called "Carbonaceous BOD").

77) Nitrifying Bacteria

- Bacteria that change ammonia and organic nitrogen into oxidized nitrogen (usually nitrate).

78) Nutrient

- Any substance that is assimilated (taken in) by organisms and promotes growth. Nitrogen and phosphorus are nutrients that promote the growth of algae. There are other trace items that are considered nutrients.



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79) Nutrient Cycle

- The transformation or change of a nutrient from one form to another until the nutrient has returned to its original form, thus completing the cycle.

80) Operation and Maintenance Manual (O&M Manual)

- A manual that describes detailed procedures for operators to follow to operate and maintain a specific treatment plant and the equipment of that plant.

81) OSHA

- A federal law designed to protect the health and safety of industrial workers and treatment plant operators. The Act regulates the design, construction, operation, and maintenance of industrial plants and wastewater treatment plants. This Act applied to municipalities in those states that have approved plans and have asserted jurisdiction under Section 18 of the OSHA Act.

82) Organism

- Any form of animal or plant life.

83) Outfall

- The point, location, or structure where wastewater or drainage discharges from a sewer, drain, or other conduit.
- The conduit leading to the final destination point or area.

84) Oxidation

- The addition of oxygen, removal of hydrogen, or the removal of electrons from an element or compound; in the environment and in the wastewater treatment process, organic matter is oxidized to more stable substances.

85) Oxygen Deficiency

- An atmosphere containing oxygen at a concentration of less than 19.5% by volume.

86) Publicly Owned Treatment Works (POTW)

- A treatment works that is owned by the state, municipality, town, city, special sewer district, or other publicly owned and financed entity as opposed to privately (industrial) owned treatment facility. This definition includes any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewerage or industrial wastes of a liquid nature.

87) Package Treatment Plant

- A small wastewater treatment plant often fabricated at the manufacturers factory, hauled to the site, and installed as one facility. The package may be either small primary or a secondary wastewater treatment plant.

88) Parasitic

- Parasitic bacteria are those that live off another living organism (the host).



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89) Pathogenic

- Bacteria, viruses, cysts, or protozoa that can cause disease in a host.

90) pH (Pronounced as Separate Letters)

- Expression of intensity of the basic or acidic condition of a liquid.

91) Physical Waste Treatment Process

- Include use of racks, screens, comminutors, clarifiers and filtration.

92) Pollution

- The impairment (reduction) of water quality by agricultural, domestic, or industrial wastes to a degree that the natural water quality is changed to hinder any beneficial use of the water or render it offensive to the senses of sight, taste, or smell when sufficient amounts of waste create or pose a potential threat to human health or the environment.

93) Pre-Aeration

- The addition of air at the initial stages of treatment to freshen the wastewater, remove gases, add oxygen, promote floatation of grease, and aid coagulation.

94) Preliminary Treatment

- The removal of metal, rocks, rags, sand, eggshells, and similar materials that may hinder the operation of a treatment plant. This is accomplished through the use of equipment such as racks, bar screens, comminutors, and grit removal systems.

95) Primary Treatment

- A wastewater treatment process that takes place in a rectangular or circular tank and allows those substances in wastewater that readily settle or float to be separated from the wastewater being treated.

96) Rack

- Evenly spaces, parallel metal bars or rods located in the influent channel to remove rags, rocks, and cans from wastewater.

97) Raw Wastewater

- Plant influent or wastewater before any treatment.

98) Receiver

- A device that indicates the result of a measurement, usually using either a fixed scale and movable indicator.

99) Receiving Water

- A stream, lake, river, or other surface or ground-waters into which treated or untreated wastewater is discharged.

100) Recirculation

- The return of part of the effluent from a treatment process to the incoming flow.



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101) Rising Sludge

- Rising sludge occurs in the secondary clarifier of activated sludge plants when the sludge settles to the bottom of the clarifier, is compacted, and then starts to rise to the surface.

102) SCADA System

- Supervisory Control And Data Acquisition System. A computer-monitored alarm, response, control, and data acquisition system used to monitor and adjust treatment processes and facilities.

103) Sanitary Sewer

- A pipe intended to carry wastewater or waterborne wastes from homes, businesses, and industries to the treatment works.

104) Screen

- A device used to retain or remove suspended or floating objects in wastewater. The screen has openings that are generally uniform in size. It retains or removes objects larger than the openings.

105) Secondary Treatment

- A wastewater treatment process used to convert dissolved or suspended material into a form more readily separated from the water being treated.
- Usually, the process follows primary treatment by sedimentation. The process commonly is a type of biological treatment followed by secondary clarifiers that allows the solids to settle out from the water being treated.

106) Sedimentation

- A tank or basin in which water or wastewater is held for a period of time during which the heavier solids settle to the bottom and the lighter materials float to the surface. Also called a settling tank or clarifier.

107) Septic

- A condition produced by anaerobic bacteria. If severe, the sludge produces hydrogen sulfide, turns black, gives off foul odors, contains little to no dissolved oxygen, and the wastewater has a high oxygen demand.

108) Sewage

- The household water and water-carried solids that flow in sewers to a wastewater treatment plant. The preferred term is wastewater.

109) Sludge

- The settleable solids separated from liquids during processing.
- The deposits of foreign materials on the bottoms of streams or other bodies of water or on the bottoms and edges of wastewater collection lines and appurtenances.



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110) Sludge Digestion

- The process of changing organic matter in sludge to a gas or a liquid or a more stable form. These changes take place as microorganisms feed on sludge in anaerobic or aerobic digesters.

111) Slurry

- A watery mixture or suspension of insoluble (not dissolved) matter; a thin, watery mud or any substance resembling it (such as a grit slurry or lime slurry).

112) Suction Head

- The positive pressure [in feet (meters) of water or pounds per square inch (kilograms per square centimeter) of mercury vacuum] on the suction side of a pump. The pressure can be measured from the centerline of the pump up to the elevation of the hydraulic grade line on the suction side of the pump.

113) Supernatant

- Liquid removed from settled sludge. Supernatant is more commonly referred to as the liquid between the sludge on the bottom and the scum on the surface of an anaerobic digester. The liquid is usually returned to the influent wet well or to the primary clarifier.

114) Suspended Solids

- Solids that either float on the surface or are suspended in water, wastewater, or other liquids, and that are largely removable by laboratory filtering.
- The quantity of material removed from water or wastewater in a laboratory test, and referred to as Total Suspended Solids Dried at 103-105°C.

115) Ultraviolet (UV)

- Pertaining to a band of electromagnetic radiation just beyond the visible light spectrum. Ultraviolet radiation is used in wastewater treatment to disinfect the wastewater. When ultraviolet radiation is absorbed by the cells of microorganisms, it damages the genetic material in such a way the organisms are no longer able to grow or reproduce, thus ultimately killing them.

116) Velocity Head

- The energy in flowing water as determined by a vertical height (in feet or meters) equal to the square of the velocity of flowing water divided by twice the acceleration due to gravity ($V^2/2g$).

117) Volatile

- A volatile substance is one that is capable of being evaporated or changed into a vapor at relatively low temperatures. Volatile substances can be partially removed from water or wastewater by the air stripping process.



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118) Volatile Solids

- These solids in water, wastewater, or other liquids that are lost on ignition of the dry solids at 550°C (1,022°F). also called organic solids and volatile matter.

119) Wastewater

- A community's used water and water-carried solids (including used water from industrial processes) that flow to a treatment plant. Storm water, surface water, and groundwater infiltration also may be included in the wastewater that enters a wastewater treatment plant. The term sewage usually refers to household wastes, but the word is being replaced by the term wastewater.

120) Weir

- A wall or plate in an open channel and used to measure the flow of water. The depth of the flow over the weir can be used to calculate the flow rate, or a chart or conversion table may be used to convert depth to flow.
- A wall or obstruction used to control flow (from settling tanks and clarifiers) to ensure a uniform flow rate and avoid short-circuiting.

121) Wet Well

- A compartment or tank in which wastewater is collected. The suction pipe of a pump may be connected to the wet well or a submersible pump may be located in the wet well.

Please do not hesitate to call the office for any questions or for a tour of the Wareham Water Pollution Control Facility. We are open Monday – Friday 7am to 3:30pm. (508) 295- 6144.

