



Water and Waste Department

Glossary of Wastewater Terms

Aerobic digestion

- a wastewater treatment process where aerobic bacteria (need oxygen to survive) feed on and break down the organic material in the wastewater
- also known as "activated sludge process"

Anaerobic digestion

- a wastewater treatment process where anaerobic bacteria (do not need oxygen to survive) feed on and break down the organic material in an oxygen-free environment
- has several advantages, including producing methane that can be recovered to generate electricity or heat, and producing municipal biosolids that may meet requirements or guidelines for land application

Bacteria

- single cell microscopic living organisms which help consume the organic material in sewage and sludge

Beneficial use

- use of municipal biosolids and municipal sludge according to the Canada-wide Approach for the Management of Wastewater Biosolids

Biological Nutrient Removal (BNR)

- the sewage treatment process of removing nutrients (total nitrogen and total phosphorus) through the use of microorganisms
- nutrients from human activity contributes to over-enrichment of surface waters, impacting the ecosystem (e.g., harmful algal blooms, low dissolved oxygen, depletion of desirable flora and fauna)

Biosolids

- residue generated during the wastewater treatment process
- also known as sewage sludge
- Class A Biosolids – the pathogens have been reduced to levels that are unlikely to pose a threat to public health and the environment under specific use conditions
- Class B Biosolids – cannot be sold or given away in bags or other containers or applied on lawns or home gardens

Biochemical oxygen demand (BOD)

- a measure of the amount of oxygen utilized by the decomposition of organic material, over a specified time period and temperature, in a wastewater sample

Canadian Council of Ministers of the Environment (CCME)

- primary minister-led intergovernmental forum for collective action on environmental issues of national and international concern
- develops nationally consistent environmental standards and practices

Clarifiers

- large tanks in which sewage is held for a period of time, during which the heavier solids (or sludge) settle to the bottom and the lighter materials (oils and grease) float to the surface

Dewatered sludge

- the solid residue remaining after removing water from sludge

Dewatered sludge cake

- the sludge after dewatering that is cake-like, compressed
- the lower the water content, the better for wastewater treatment purposes

Dewatering

- removing water from sludge or other solids

Digestion

- the biological decomposition of the organic matter in sludge
- results in by-products such as methane gas, carbon dioxide, sludge solids and water

Denitrification

- the anaerobic biological reduction of nitrate nitrogen to nitrogen gas

Disinfection

- the killing of waterborne fecal and pathogenic bacteria and viruses in the wastewater effluent with a disinfectant (e.g., ultraviolet light, chlorination, dechlorination)

Dissolved oxygen (DO)

- the amount of oxygen dissolved in liquid, expressed as milligrams per liter (mg/L) or percent saturation

Effluent

- the treated wastewater flowing out of the sewage treatment plant into a receiving body of water

Emerging substance of concern (ESOC)

- a Canadian term for a group of substances that have recently become the focus of research into their fate and effects in the environment (e.g., pharmaceuticals, personal care products, plasticizers, surfactants, brominated flame retardants)
- may be present in biosolids, in quantities measured in the parts per million to the parts per trillion

Land Application

- the recycling or disposal of wastewater solids (biosolids) to the land under controlled conditions as a fertilizer or soil conditioner

Nitrogen (N)

- an essential nutrient that is often present in wastewater as ammonia, nitrate, nitrite, and organic nitrogen

Nutrient

- any substance that is essential for the growth of plants and animals
- in wastewater, usually nitrogen and phosphorus, may cause unwanted algal and plant growths in lakes and streams

Nutrient recovery

- recovery of nutrients directly from the wastewater stream through precipitation or other emerging technologies

Pathogens

- pathogenic or disease-producing organisms

pH

- a measure of acidity or alkalinity of water, or any given substance
- the scale is 1 to 14 with 7 being neutral, over 7 is alkaline or caustic, and under 7 is acidic

Phosphorus (P)

- an essential chemical element and nutrient for all life forms

Reuse

- beneficial use of reclaimed or repurified wastewater or stabilized biosolids

Secondary wastewater treatment

- second biological process of wastewater treatment, usually using some form of the activated sludge process

Sludge

- the solid waste material which settles out in the wastewater treatment process, sometimes biosolids
- can be dewatered and reused or disposed

Sludge dewatering

- removing much of the remaining water from sludge for reuse and to lighten the sludge for reuse or disposal

Thermal drying

- the physical process of reducing moisture through evaporation
- generally produces a granular product that is greater than 90% solids, and is similar in consistency and form to granular fertilizers
- several pelletized municipal biosolids are commercially sold as fertilizers in Canada and the United States

Thermal oxidation

- the combustion and gasification of primarily the carbon content of biosolids with or without energy recovery
- considered by CCME to be a viable beneficial use management option where there is recovery of energy and ash

Total suspended solids (TSS)

- the amount of insoluble solids floating and in suspension in the wastewater
- must be removed in the wastewater treatment process (e.g., filtered out, flocculated, settled, digested)
- considered to be a measure of pollutants in water

Ultraviolet disinfection (UV)

- the use of ultraviolet light to kill bacteria and other microorganisms in water and wastewater
- typically a final treatment process

Wastewater (or sewage)

- the spent or used water of a community containing dissolved and suspended matter

References

1. The Capital Regional District (CRD) document (the CRD is the regional government for the 13 municipalities and three electoral areas that are located on the southern tip of Vancouver Island.)
2. Metcalf & Eddy, Inc. Wastewater Engineering Treatment and Reuse, 4th Edition, 2003
3. Metcalf & Eddy / AECOM, Wastewater Engineering Treatment and Resource Recovery, 5th Edition, 2014
4. CCME – Guidance Document for the Beneficial Use of Municipal Biosolids, Municipal Sludge and Treated Septage, Canadian Council of Ministers of the Environment, 2012.
5. CCME – Canada-wide Approach for the Management of Wastewater Biosolids October, 2012
6. Water Environment Federation – Glossary of Wastewater Terms