



The Basics of Biosolids

What are Biosolids ??

Biosolids are a byproduct of wastewater treatment. Biosolids, the solid or semi-solid organic material generated by a wastewater treatment plant, result from the treatment of wastewater carried through sewer lines from homes and businesses to the treatment plant. Following treatment, the liquid (effluent) is typically discharged to a nearby stream and the solids (biosolids) or a product developed from the solids are removed from the treatment plant for disposal or beneficial use.



Anaerobic Digesters at Highland Falls STP

Biosolids characteristics vary depending on the sources of wastewater to the treatment plant and the treatment methods used at the treatment plant, and these characteristics will determine if beneficial use is feasible.

Types of Biosolids Treatment

Treatment methods can be grouped in a variety of ways. The following information groups the treatment methods in two broad categories, based primarily on the reduction of harmful organisms that is achieved.

Stabilization - a process to reduce the concentration of harmful (disease-causing) organisms, odor, and in some cases the volume, of the biosolids. The methods are not exclusive - more than one method may be used at a treatment plant. Typical methods include:

Digestion - a biological method of treatment involving the use of microorganisms to break down the complex organic substances found in untreated biosolids. Digestion occurs in a vessel, in either an oxygen-free (anaerobic) environment or in the presence of oxygen (aerobic).

Lime Stabilization - the addition of an alkaline material, such as lime, to biosolids to raise the pH of the biosolids. Raising the pH reduces the concentration of disease-causing organisms and reduces the odor of the material.

Air Drying - placing biosolids in a layer on a sand bed or paved surface for an extended period of time. Evaporation and draining result in a much drier material.

Advanced Stabilization - a process used to reduce harmful organisms to below detectable levels and produce a marketable product. Typical methods include:

Composting - an aerobic biological process that accelerates the natural decomposition process under controlled conditions. The biosolids are dewatered and mixed with an amendment, such as wood chips or yard waste, and the mixture is allowed to decompose in an aerobic environment. The resultant material is a humus or soil-like material typically used for landscaping and other soil amendments.

Heat Drying - the use of a drier to remove most of the water from biosolids. In some facilities, the resultant product is in the shape of pellets, which is why the process is sometimes referred to as pelletization. The pellets can be marketed as a fertilizer or for soil conditioning purposes.

Chemical Fixation - a process involving the blending of biosolids with lime and, in some cases, kiln dust. It differs from lime stabilization because sufficient alkaline material is added to produce heat during treatment, in addition to raising the pH of the material. The resultant product is typically used as a liming agent in agriculture.

Biosolids Management Options

Beneficial Use - after stabilization, composting, heat drying, or chemical fixation, biosolids can be beneficially used at appropriate application rates as soil conditioners (fertilizers, sources of organic material, etc.) on farmland, forest land, public works projects, landscaping activities, and land reclamation.

Incineration - the firing of biosolids at high temperatures in an enclosed device. Results in an ash that must be properly disposed.

Landfilling - the placement of biosolids in a disposal facility, including monofills (sludge-only landfills) and co-disposal with mixed solid waste. Typically, landfills must have liners, groundwater monitoring, and comply with other regulatory design and operational criteria.

Facts Sheets Available:

No. 1 The Basics of Biosolids
No. 2 Federal Regulation of Biosolids Recycling
No. 3 State Regulation of Biosolids Recycling
No. 4 Biosolids Management in New York State
No. 5 Beneficial Properties of Biosolids

No. 6 Biosolids - Pollutants of Concern
No. 7 Pretreatment and Source Control
No. 8 Biosolids Recycling Methods
No. 9 Biosolids Recycling Case Studies
No. 10 Biosolids Terms and References

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