



# Interactions and Emission of Sewage Sludge for Organic Pollutants

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## DESCRIPTION

Sewage sludge is a semisolid, or slurry of residual material that is produced as a by-product of wastewater treatment processes. It is commonly classified as primary and secondary sludge. It is composed of by-products that are collected at different stages of wastewater treatment process. It contains both compounds of agricultural value and pollutants which usually contains heavy metals, organic pollutants and pathogens.

The characteristics of sludge depend upon the original pollution load of treated water, and also on technical characteristics of waste water and sludge treatments are carried out. It is usually treated before disposal or recycling in order to reduce its water content, its fermentation or the presence of pathogens. Several treatment processes exist, such as thickening, dewatering, stabilization and disinfection, and thermal drying. It may undergo one or several treatments.

### Land spreading

The sludge-derived material can partially replaces the use of conventional fertilizers, since it contains compounds of agricultural value. It also contains organic matter, that form at a level below which could have a significant positive impact on soil physical properties. The composted sludge, however presents a more stable organic matter due to the addition of co-product during the process. However, it also involves in the application of the pollutants contained in sludge to the soil. They undergo different transformations or transfer processes. These processes include leaching to groundwater, runoff, microbial transformation, plant uptake and volatilization and enable transfer of the compounds into the air and water, and their subsequent introduction into the food chain.

Therefore, the outputs of sludge recycling consist of yield improvement, but also the emissions of pollution into the soil, and indirect emissions into air and water. Other emissions into the air which includes exhaust gases from transportation and application for vehicles.

### Incineration

It is a combustion reaction. The different techniques that are currently performed are classified between mono-incineration when sludge is incinerated in dedicated plants, other wastes, or co-incineration when sludge is used as fuel in energy or material production. Other technologies are also being developed, such as wet oxidation or pyrolysis. Outputs are flue gases, ashes, and wastewater, as well as production of energy.

Therefore, it generates the emissions into air, soil and water (flue gas treatment wet processes). It may be reduced to flue gas treatment. The emission depends upon the process that is influenced by sludge type. The energy production is generally counterbalances at which the energy needs for sludge drying. Operation of an incineration plant may also produce noise, dust, odor and visual pollution.

### Landfill operation

There are two possibilities in terms of sludge landfilling: mono-deposits, where only sludge is disposed of, and mixed-deposits, when the landfill is also used for municipal wastes. The inputs of landfilling are waste and additional resources that are required for the operation of landfill site, such as fuel for vehicles, electricity, and additional materials when the leachate is treated on-site. Outputs consist of leachate, landfill gas and energy production when they are recovered. Landfill operation therefore generates emissions into the air, and into the soil and water at dumpsites. The operation of a landfill also generates other impacts in terms of noise and dust from the delivery vehicles, as well as odor, land use, disturbance of vegetation and the landscape.

Digested sludge is put through large centrifuges that works in same fashion as a washing machine spin cycle. The spinning centrifuge produces a force which separates the majority of the water from the sludge solid, creating a bio-solid substance.

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## CONCLUSION

The primary sludge is generated from chemical precipitation, sedimentation, and other primary processes, whereas secondary sludge is the activated waste biomass resulting from biological

treatments. Some sewage plants also receive septage or septic tank solids from household on-site of wastewater treatment systems. Sludge treatment is focused on reducing sludge weight and volume in-order to reduce the transportation and disposal costs, and on reducing potential health risks of disposal options.