

USING SEPTAGE TO ACCELERATE ENERGY GENERATION IN A BIOREACTOR LANDFILL

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ABSTRACT

Residential septage is an on-going wastewater challenge for municipalities. Conventional methods of septage disposal – land application and waste water treatment plants – can result in surface water pollution, overloading of plant processes, and increased energy consumption. This paper presents a case history of an innovative treatment technology that improves the management of both septage and municipal solid waste (MSW) to avoid these problems.

This technology provides accelerated renewable energy generation while extending the life of an operating landfill. Mixing septage with MSW can be “win-win” combination - residential septage is safely treated and used to accelerate the waste decomposition and methane generation in a landfill. A septage bioreactor landfill project was developed to demonstrate the feasibility of this concept. This project included the construction and operation of a full-scale, 7-acre demonstration septage bioreactor landfill cell. Landfill operations are conducted in an engineered and controlled manner that limits both groundwater pollution and air pollution.

After four years of operation, preliminary results show that septage addition has dramatically increased the methane generation rate in the septage bioreactor landfill, making it possible for the owning municipality to construct a landfill gas to electricity facility. The electricity generated from this facility will be used to power on-site operations and sold to a local utility, generating revenue for the owner. Also, the leachate collected from the bioreactor cell is comparable to conventional landfill leachate, demonstrating that this technology also reduces the cost to treat septage.

This paper describes the development and operation of this full-scale system and discusses the regulatory and operational challenges for implementing this technology. The preliminary results from this project will be presented to discuss the effectiveness of septage bioreactor landfill applications for MSW and septage treatment.