



REAL SOLUTIONS TO WASTEWATER CHALLENGES

Solving Wastewater Disposal Challenges With Innovative
Evaporation Technology For Over 19 Years



LANDFILL LEACHATE



CHALLENGE:

Reduce Landfill Leachate Disposal Cost

Wastewater generated by the runoff of leachate from municipal and hazardous waste landfills can have a negative environmental impact if not controlled and treated correctly. ENCON Evaporators can, by itself or used in conjunction with other technologies, provide an excellent solution for handling this type of wastewater.

What is Landfill Leachate?

Landfill leachate is the runoff water that occurs from operational or closed landfills. These water flow at lower rates on dry days when naturally occurring moisture percolates out and at higher rates on rainy days when the leachate waters are combined with stormwater. Municipal landfill leachate water is often characterized by four main groups of contaminants:

- Dissolved organic matter
- Inorganic macro components
- Heavy metals
- Xenobiotic organic compounds

Hazardous waste landfills are characterized by all of the above and potentially more including compounds regulated by the RCRA.

Leachate characteristics are determined by the site, design, solid waste, mode of operation at the landfill, as well as the age of the landfill itself. Young landfills (<5 years) tend to have a lower pH as well as higher levels of COD, BOD and heavy metals. Ammonia and salinity can also be a factor no matter the age of the landfill.

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Why is Landfill Leachate an Issue?

Landfill wastewater is regulated by most Federal and State Environmental Agencies. These agencies have deemed landfill leachate a threat to local tributaries as well as municipal water supplies and groundwater located in proximity to these landfills. The EPA standards for Municipal Solid Waste Landfills (MSWLF) requires landfills to have a system for leachate collection and treatment.

What are the Challenges to Handling Landfill Leachate?

Beyond the capturing and containment of landfill leachate, variability in characteristics and concentration of contaminants are challenges to effective handling this type of wastewater. The changes to landfill characteristics over time can pose additional challenges to a leachate treatment system. The treatment used at one stage of the landfill's life may not be as effective later. Evaporation technology has the advantage over other technologies (membrane, chemical treatment, etc.) of being able to handle a wide range of waste stream variability.

PUT OUR ENGINEERING AND REGULATORY EXPERTISE TO WORK FOR YOU

ENCON Evaporators provides the following services relative to evaporation/distillation projects:

- *FREE wastewater qualification analysis to ensure application feasibility*
- *Regulatory compliance and paperwork*
- *System design and compliance for hazardous waste applications*
- *PLC programming to optimize system automation*
- *Closed loop recycling evaluation and analysis*



SOLUTION:

Option 1: Evaporation Alone

Certain landfill leachate applications are at a volume and characteristic that make it feasible to evaporate to atmosphere a very high percentage of the overall volume. Since landfills often have a significant supply of naturally occurring gas; there is great potential to use this gas as a free energy source to evaporate the wastewater. ENCON offers thermal evaporators that can efficiently burn the off spec landfill gas at a rate that keeps up with the generation of landfill leachate wastewater.



ENCON Thermal Evaporator

Option 2: Multiple Technology Solution Featuring Evaporation

Some landfill leachate applications are at a (higher) volume and characteristic that make it more sensible to use multiple technologies, including evaporation, to cost effectively treat these waters. In particular, a system might include treatment such as:

- Filtration
- Softening
- Ultra Filtration (UF) or Reverse Osmosis (RO)
- Evaporation



ENCON MVC Evaporator

The reject waters from the UF or RO system go to the evaporator. In this case, the evaporator could be the previously mentioned ENCON Thermal Evaporator that is heated with free off-spec landfill gas or an ENCON MVC Evaporator with two stages of heat recovery that evaporates and recovers water as distilled water with minimal energy requirements.

TECHNOLOGY:



ENCON Thermal Evaporator

The ENCON **Thermal Industrial Wastewater Evaporator** product line ranges in capacity from 8-400 gal/hr. These evaporators are capable of being heated by natural gas, propane, steam, #2 fuel oil, diesel, kerosene, off spec gas, waste oil or electricity. Alloys of construction include: 316L Stainless, 6% Molybdenum Super Stainless, and Hastelloy C to provide appropriate corrosion protection. Standard units exhaust water vapor to atmosphere. The optional condenser captures water vapor as distilled water.

TECHNOLOGY:



ENCON MVC Evaporator

The **ENCON MVC Evaporator** product line has standard offerings that range in capacity from 40-1800 gallons/hour. These systems operate on steam or electricity and compressed air at a typical operating cost of \$0.01-\$0.02* per gallon of distilled water. Materials of construction include 316 Stainless Steel and Super Stainless alloys for more corrosive waste streams.

* Assumes electricity cost of \$0.10/kW-h



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