CASE STUDY
LANDFILL LEACHATE

ENCON THERMAL EVAPORATOR

Application
Landfill leachate volume reduction at an F039 US hazardous waste landfill located in the Southeast.

Background
Client operates closed hazardous waste landfill in the Southeast of the USA. Leachate is collected from the landfill at the site and sent to a Central Tank Farm. Leachate was being hauled to a TSDF facility.

Client Needs
Client hauled 1,200,000 gallons per year of excess landfill leachate to a TSDF treatment facility at a cost of $0.57/gallon. The client wished to reduce or eliminate the cost.

Application Challenges
Landfill leachate is the waste liquid that drains or 'leaches' from a landfill. The composition and volumes of the leachate vary over time. This leachate had heavy metals, high suspended solids (TSS), corrosive ions (chlorides), low pH and solvents (VOCs). This made the leachate difficult to treat effectively with traditional technologies due to its corrosive nature, variability in the feed stream and its tendency to foul equipment.

Options Investigated
The client explored conventional treatment options such as biological and partial metals/solvent reduction. They concluded that the biological option would not work due to the relatively low and decreasing leachate volumes. Partial metals and solvent reduction could declassify the leachate, but this did not affect leachate volume and thus still required costly hauling to a treatment facility.

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The Solution

Evaporation was investigated as part of an overall leachate treatment system. Partial metals and solvent removal were implemented upstream from the evaporator to de-classify the leachate from the hazardous category. The evaporator reduced the partially treated leachate volumes by 93%. This decreased leachate volumes enough to where they could be further dried to a solid using a slurry dryer. The solids from the pre-treatment step and the slurry dryer were combined and taken to a landfill at a much lower cost compared to hauling liquid leachate. Without evaporation, the pre-treated leachate volumes were too high to make drying practical. The overall treatment system successfully dried all of the hazardous liquid leachate into a solid form that could be more easily (and less expensively!) disposed of. The total payback period was <2.5 years.

ENCON's use of a custom design philosophy to ensure client system met desired performance and facility integration requirements was a differentiating factor between ENCON and alternative evaporator suppliers.

Results

- ✓ 93% reduction in leachate volume via evaporation
- ✓ Eliminated need to haul liquid leachate
- ✓ Clean water vapor returned to atmosphere
- ✓ Solids taken to an offsite landfill
- ✓ Projected payback for total installed cost: <2.5 years

Evaporator Specifics

ENCON Model: P66V4-400

Heat Source: Propane

Evaporator Capacity: 400 gallons per hour of evaporation

Evaporator Materials of Construction: 6% Molybdenum super stainless steel, Hastelloy C level probes

Electrical: 480V, 3 phase, 60Hz

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