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LANDFILL GAS TO ENERGY

DEQ U.P. Solid Waste Forum

February 6, 2014

Anatomy of a Landfill

- Protective Cover
- Composite Cap System
- In-Place Waste
- Gas Collection System
- Leachate Collection System
- Composite Liner System
- Subgrade
- Groundwater Monitoring

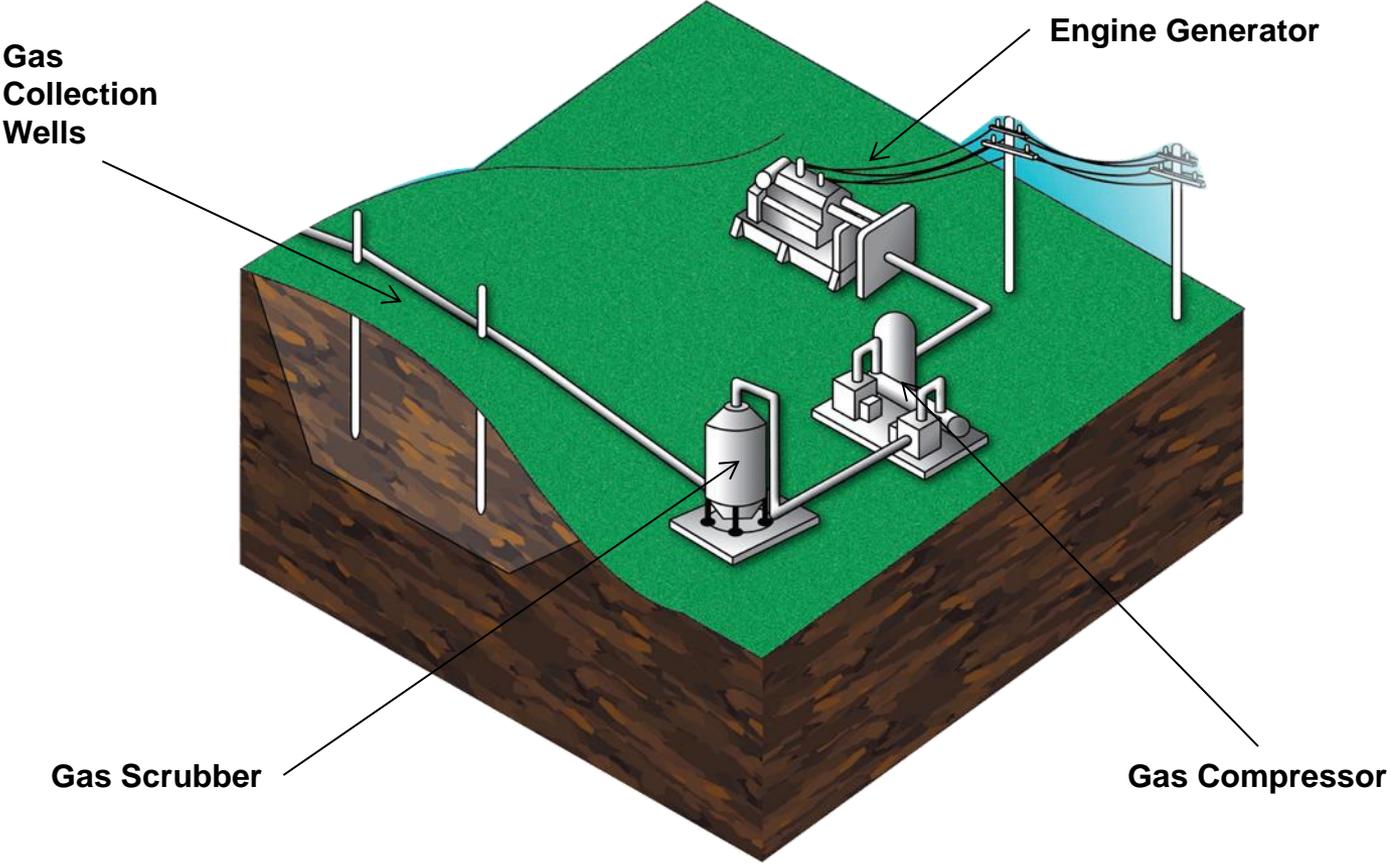


Energy from Landfills

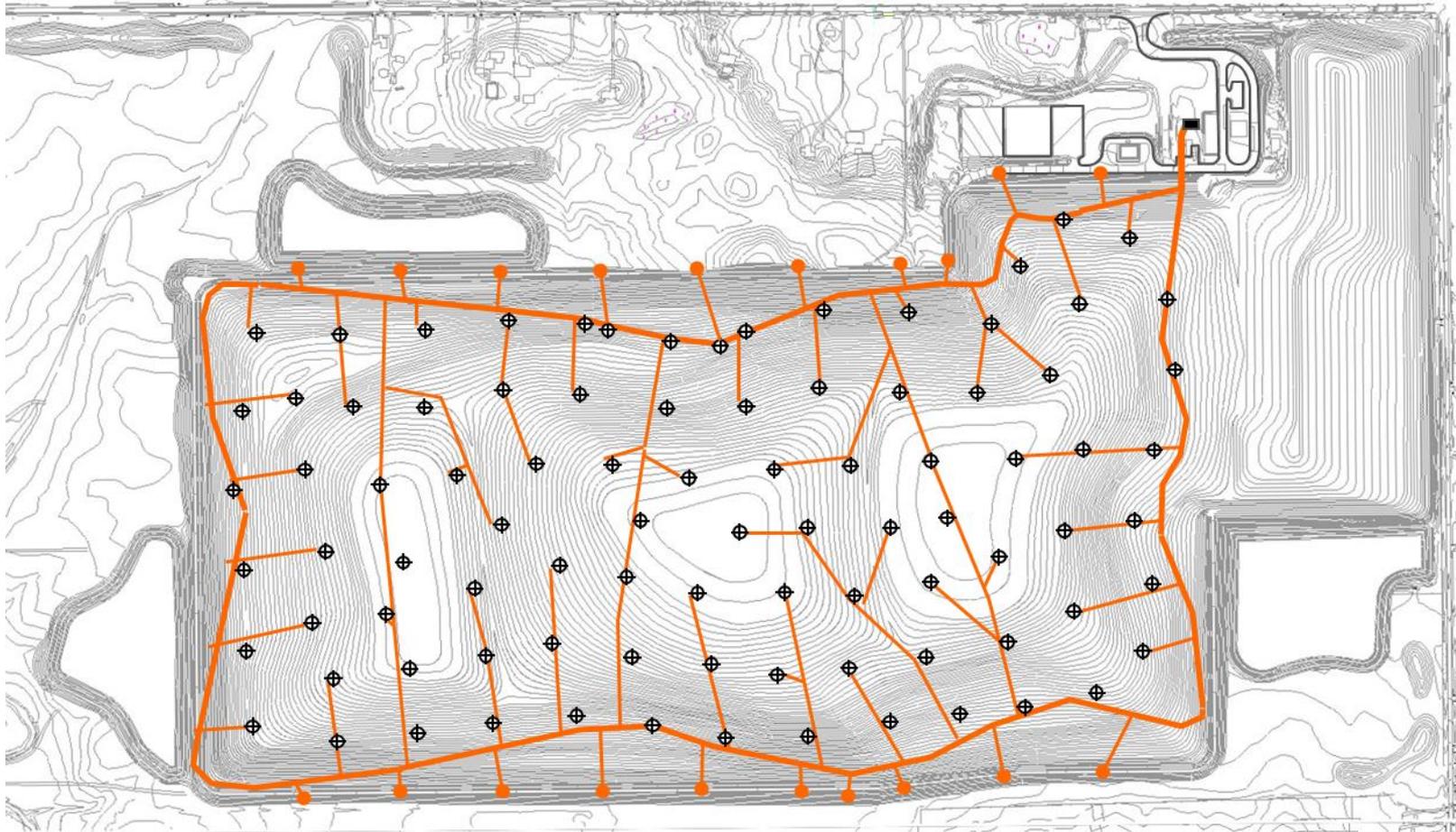
- Energy from landfill gas begins with collection of refuse
- Waste disposed of in landfills decomposes, creating landfill gas
- Landfill gas contains methane
- Gas collected from landfills can be used as a green energy source



Energy from Landfills



Typical Gas Collection System



Gas Collection Well

- Gas is recovered through wells drilled in the waste
- Gas wells can also be horizontal collectors
- A vacuum is applied to the wells to draw the gas out of the landfill



Michigan Landfill Gas to Energy

Nine landfill gas to energy projects:

- City Sand, Wayne County
- Autumn Hills, Zeeland
- Eagle Valley, Orion
- Northern Oaks RDF, Harrison
- People's Landfill, Birch Run
- Pine Tree Acres, Lenox Township
- Venice Park, Lennon
- Westside, Three Rivers
- Woodland Meadows, Van Buren



Produce enough clean energy to power nearly 50,000 homes

More than 36 MW of power output



Landfill Gas to Energy Facility

- Landfill Gas is used to fuel engines to generate electricity



Northern Oaks Energy Facility

- CAT 3520 produces 1.6 MW of electricity, enough to service approximately 1200 homes



Other Uses for Landfill Gas

- Fuel for Heating and Boilers
 - Zeeland Farm Services
 - Ford Stamping
 - GM Assembly
- Fuel for Evaporating Leachate



Leachate Evaporator

- Utilizes landfill gas as a fuel source
- Evaporates 30,000 gallons/day
- 3% residual recirculated back into the landfill



Leachate Evaporator

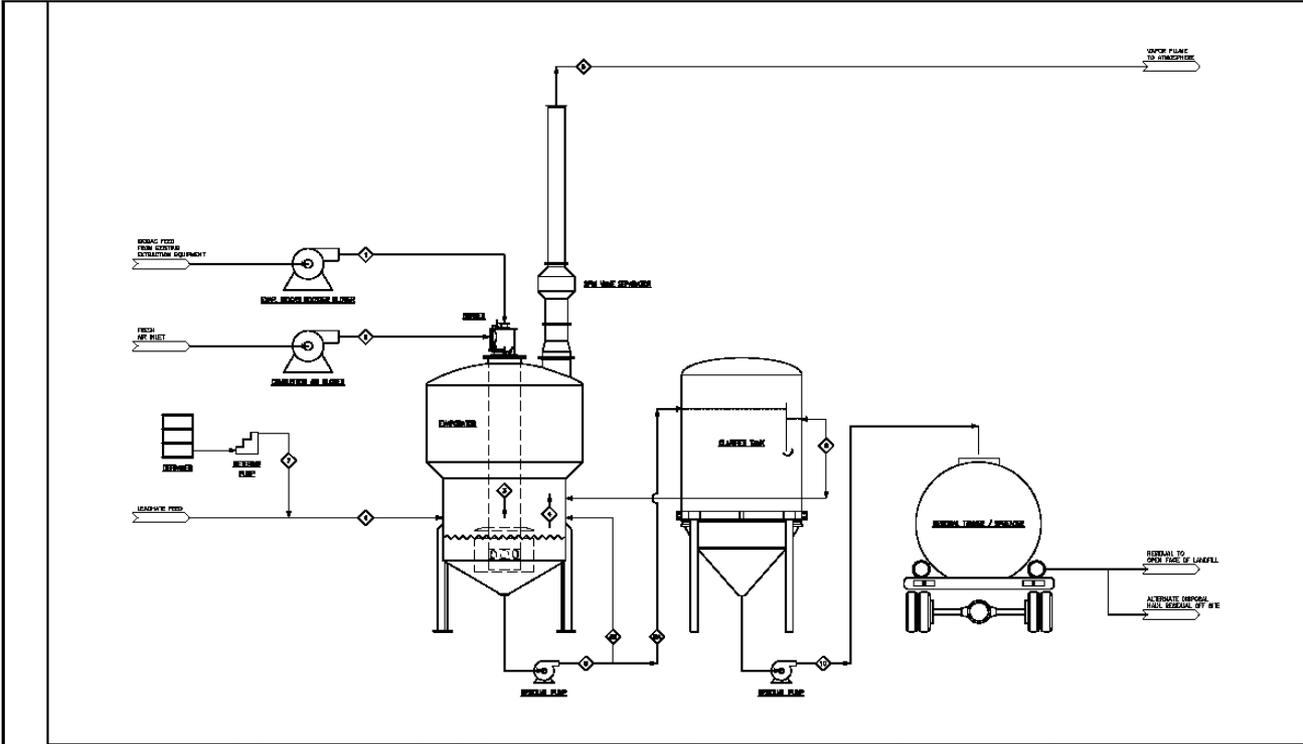
Construction:



Completion:



Process Flow Diagram



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Evaporator Permitting Aspects

Operating Permit

- Separate permit not required
- Modification to LRP for management of residual

Air Permit (Part 55)

- Air permit not required
- Minor source per Rule 278
- Insignificant source per Rule 290



Summary

LFGTE Plant

- Utilizes 600 cfm of landfill gas
- Operates 24/7
- Generates 1.6 MW of electricity
- Enough energy for roughly 1200 homes
- Offsets the use of more than 6000 tons of coal annually

Leachate Evaporator

- Utilizes 600 cfm of landfill gas
- Operates 24/7
- Evaporates 30,000 gallons of leachate/day
- Offsets the use of approximately 36,000 gallons of diesel fuel annually



Questions???

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http://www.youtube.com/watch?v=w1RKMMpRRHY&feature=channel_video_title

