

Pertinent Information Regarding Greenhouse Gas Emissions and Effective Use of Landfills for the Betterment of the Environment¹

It is a well-known fact that waste management practices can impact Greenhouse Gases (GHG) and the environment. Municipal Solid Waste (MSW) decomposes over time. Methane Gas is a decomposition product that has adverse effects as a GHG, as a fire hazard at landfills and as a noxious odor that may waft outside the boundaries of a landfill to the surrounding community.

So what are the alternatives for landfills? There are basically four types of landfills to consider when trying to understand their impacts on GHG emissions. The four types are: (1) landfills without Landfill Gas (LFG) recovery, (2) landfills with LFG recovery and flaring, (3) landfills with LFG recovery and electricity generation, and (4) the U.S. national average landfill (no LFG recovery).

The landfills with no LFG recovery and some form of removal or use are not optimal due to the myriad of adverse conditions such as explained above. Landfills, such as Pioneer Crossing Landfill, currently using method number 2 that utilizes flares are beneficial for overall reduction of GHG emissions as compared to the landfills with no recovery and use. However, when comparing the simple burning off of gases using the flares to utilizing the gases to generate electricity while being burned off, one would notice that option number 3 is a more effective way of lowering GHG emissions. This is accomplished by burning off the gases and generating power that will take the place of generation that is normally performed by the burning of fossil fuels. As such, the net GHG emissions utilizing option number 3 (landfills with LFG recovery and electricity generation) are a little more than two times less than just burning off the gases.

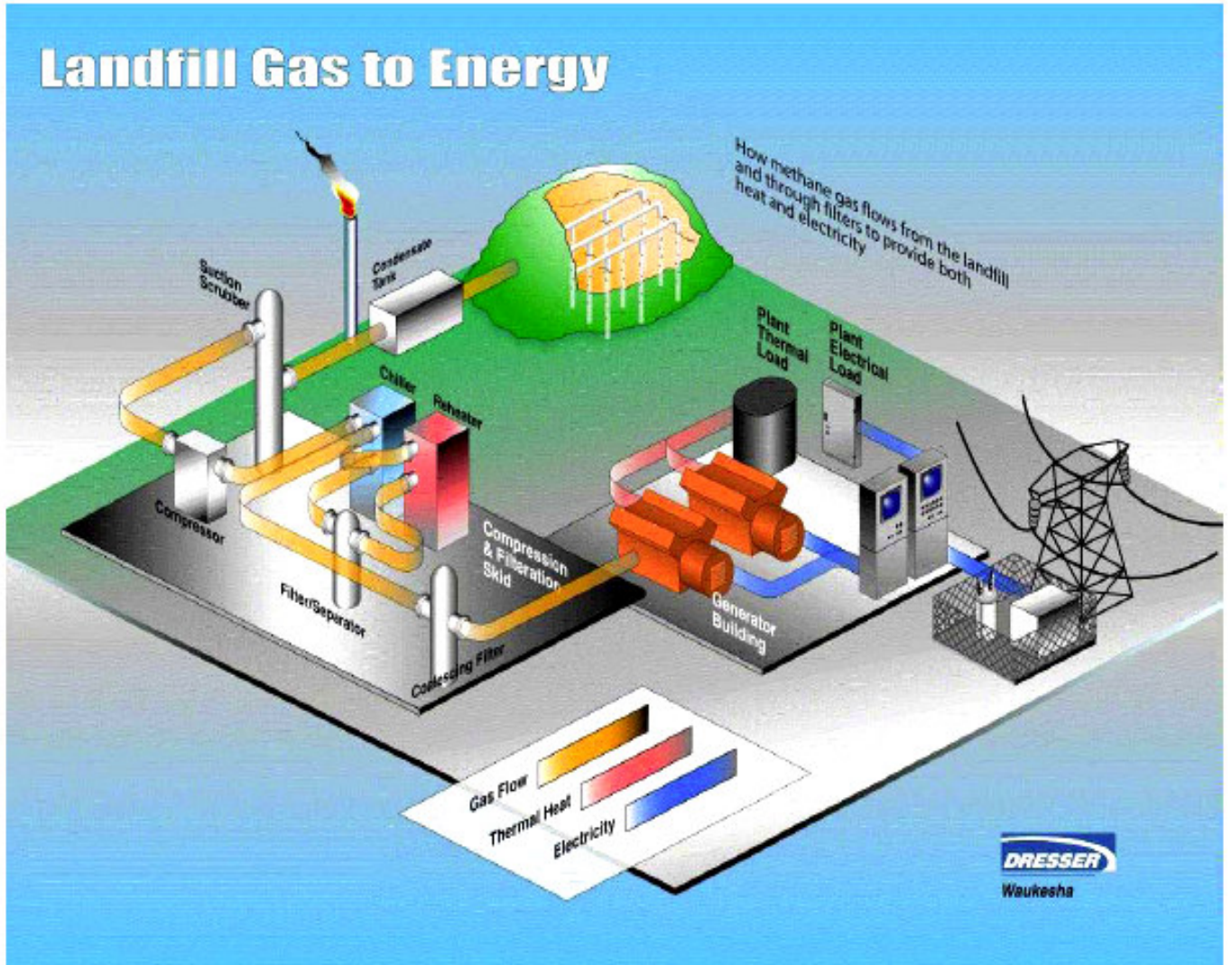
Clearly, landfills are here to stay and, in particular, Exeter Township will have to deal with the Pioneer Crossing Landfill for years to come. Accordingly, we must find ways to effectively provide the space necessary for waste disposal, while ensuring that we are maintaining good stewardship of the environment. Our country and others have long recognized these same issues. Accordingly, in 1993, the U.S. passed its "Climate Change Action Plan" (CCAP) to outline voluntary initiatives to reduce GHG emissions. The EPA, Department of Energy and the Department of Agriculture who have decided to work together support this plan. Costs of constructing and utilization of LFG Electricity Generation Plants are high compared to other potential generating sources. However, the DOE has established guidelines for purchase of power generated by plants like these in order to ensure their continued use and expansion.

¹ Source of information: Paper entitled, "Greenhouse Gas Emission Factors for Municipal Waste Combustion and Other Practices" written by J. Randall Freed and Anne Choate (ICF Consulting Group, 1850 K St., NW, Suite 1000, Washington, DC, USA 20006) and Eugene Lee (US Environmental Protection Agency, 401 M St., SW, 5396W, Washington, DC, USA 20460)



Typical Landfill Gas Flare²

² [LFG flare](http://www.epa.gov) from www.epa.gov



Typical Landfill Gas to Energy Plant³

³ [Overview of LMOP and the landfill gas energy field](http://www.epa.gov) from www.epa.gov

LFGE Projects Provide Dual Benefits



- Destroys methane and other organic compounds in LFG
 - Each 1 MW of generation = planting ~11,300 acres of trees per year, removing the emissions of ~8,400 cars per year, or preventing the use of ~89,000 barrels of oil per year
- Offsets use of nonrenewable resources (coal, oil, gas) reducing emissions of:
 - SO₂ contributes to acid rain
 - NO_x contributes to ozone formation and smog
 - PM is a respiratory health concern
 - CO₂ is a global warming gas

Landfill Gas to Energy Benefits⁴

⁴ [Overview of LMOP and the landfill gas energy field](http://www.epa.gov) from www.epa.gov