Developing a Landfill Gas Sampling Plan

Kansas
Department of Health and Environment

1:15 to 1:45 PM, May 7, 2014 in Salina

Clean Air Act General Requirements

- All landfills that have a design capacity equal to or greater than 2.5 million megagrams (MG) or 2.5 million cubic meters (or 3.27 million cubic yards) **or** demonstrate a potential to emit equal to or greater than 50 MG of NMOCs per year shall have a Gas Collection and Control System (**GCCS**).*
- Nine of 18 Subtitle D Kansas landfills have a design life less than 3.27 million cubic yards.

* Tier 2 and 3 exemptions exist.

Available Support Documents

1. **Training Primer for Sampling of MSWLF Emissions for the Determination of Postclosure Care Reduction/Termination Plan** (4-23-14); Document 10, 2013.
2. **Landfill Gas Sampling Plan for Reduction and/or Termination of Postclosure Care,** Technical Guidance Document SW-2013-G2, Document 2, 2014.

Where to start?

As before, let's begin with the **heart** of **Support Document No. 1**: **The Training Primer for Sampling of MSWLF Emissions** which **is based on** the taking of **representative leachate and LFG** samples.

Then, we will focus on the **collection of landfill gas** from a LFG wellhead.

Taking a Representative Sample:

Of a LFG wellhead. **How do you do this?**

Answer: You take an aliquot/portion of the whole regime (contained within the well's radius of influence) at the wellhead when it is flowing so that it best represents the regime. A **non-flowing** regime is undesirable since the gas at the wellhead is not as representative.

Non-flowing LFG Wellhead

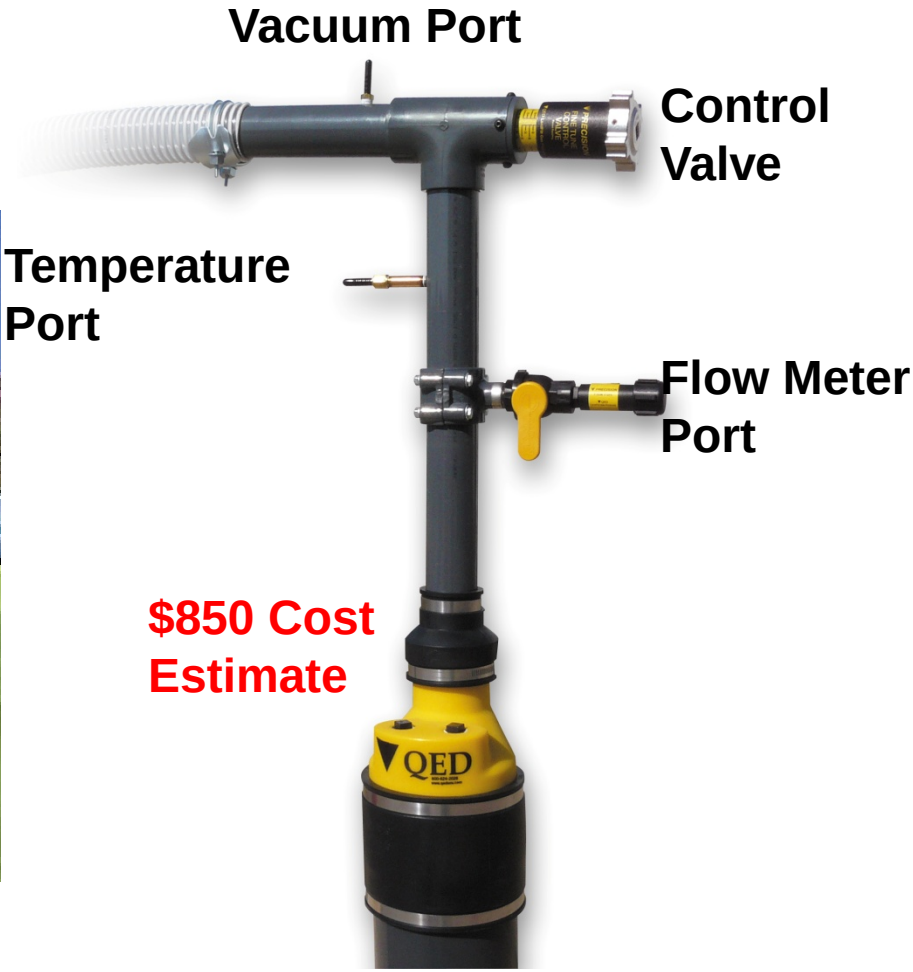
If a wellhead is not flowing (closed off or has a low vacuum) and a sample is to be taken, then the flow should be initiated by opening the cutoff valve or by increasing the system vacuum on the wellhead. A sample should be taken after the flow has flushed the well piping so that fresh LFG can be collected but without introducing oxygen* into the regime.

* Which results in lower LFG Btu's & potential fires.

LFG Flow Meter Wellhead: QED Environmental Systems

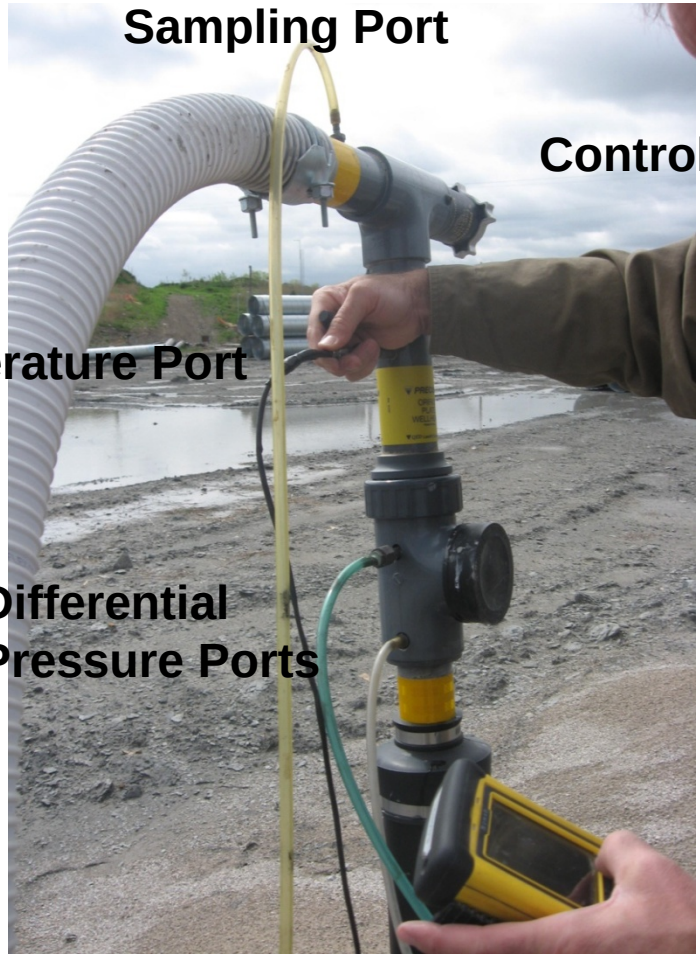
Flow measurement with Thermal Mass Flow Meter

$6,000 Cost Estimate



LFG Analyzer/Flow Meter

Wellhead: Elkins Earthworks



Orifice Access Port $400

Cost Estimate for Orifice Plate System and Plate Kit

Wireless Meter

Sampling and Differential Pressure Lines

LFG Analyzer: Elkins Earthworks

Gas and Pressure Lines to Analyser

Wireless Analyser in Back Pack

$10,000 Cost Estimate for meter and wireless analyzer vs $105 to 140 per sample for lab analysis which includes rental cost for containers.

LFG Meter: Landtec

Rentals: $140/day, $420/week or $1,260 per month plus accessories costs; also can purchase for about $10,000.

Features:

- Measures % of CH_4, CO_2, O_2, CO, H_2S; static pressure, and differential pressure
- Displays CH_4 in % LEL
- Displays user-defined comments
- Calculates balance gas, flow (SCFM) and calorific value (KW or BTU)
- Records site and well conditions
- Used in gas extraction wells, flare monitoring, landfills, and biogas sites

Sampling GCCS Wellheads

- The **GCCS** layout for the total (primary and perimeter wells) system will dictate the sampling approach. Primary phase sampling should be done at least monthly (perimeter more frequently) for all wellheads and for the **key parameters** [LFG flow, CH_4, CO_2, O_2 and nonmethane organic compounds (NMOCs)].
- **GCCS total flows and analyses** should be made.
- **LFG and leachate** sampling should be coordinated to allow emission comparisons.

Added Benefit of Supplemental Monitoring*

A predicted benefit of this effort is the improved management of the MSWLF operations, in general; and, in particular, a greater certainty of a successful PCC reduction and/or termination efforts.

As Peter Drucker said (according to Dennis Degner): **"You can't manage what you don't monitor."**

* **Recall Input/Output Tables 1 to 3 in the AM Session at 2014 SWANA meeting. In general, most supplemental measurements involve improved recording keeping; however, an on-site weather station is recommended. $400 to 3,500 Cost Estimate**

Questions re to Developing Leachate and LFG Sampling Plans

Kansas Department of Health and Environment

See: http://kdheks.gov/waste/p_pcc.html for BWM PCC Documents and/or

Contact: cburkhead@kdheks.gov or 785-296-6898 for further information about the PCC Workshop.