

TITLE: QED's Precision Landfill Gas Flow Meter Improves Accuracy, Saves Valuable Field Labor

Courtesy of David Kaminski of QED Environmental Systems

Landfill gas or "LFG", which is generated from the biodegradation of municipal solid waste, is an abundant source of renewable energy. The gas is typically about half methane and half carbon dioxide and can be used to replace traditional fossil fuels to heat buildings, boilers and kilns, run generators to make electricity, and even produce LNG fuel to power vehicles such as garbage collection trucks and city buses. A typical municipal landfill can produce enough energy from landfill gas to power 4,000 homes for as long as 20 years.



Getting the gas out of the landfill requires a collection system that draws the gas out under vacuum. Shallow vertical wells drilled into the landfill are connected to a header system and blower that carries the gas to a central collection point. Gas flow measurements are taken at various points in the system, from the gas wells to the main collection header.

Flow measurements taken at gas wells are used to determine well performance over time and to identify issues that might reduce gas collection rates, such as liquid accumulation in the well. Historically, flow has been a calculated value derived from a pressure change measured across an orifice plate, pitot tube or venturi. These traditional flow measurement devices are designed for air and dry gases, so they don't always work properly in the landfill environment. Landfill gas can be very warm and is fully saturated with humidity, which can clog pitot tube openings or accumulate on orifices plates and then freeze in cold climates, making accurate measurements difficult. Significant changes in flow require orifice plate diameters to be changed to get accurate readings, which can take up valuable field time and can be a difficult task in bad weather. Venturis avoid some of the problems seen with orifice plates or pitot tubes but they often restrict gas flow at higher flow rates. Flow measurements taken at LFG wells using these traditional approaches are often highly inaccurate, often biased as much as 10-20%.

To solve the challenge of getting accurate gas well flow values, QED Environmental Systems saw an opportunity to apply a better method of flow measurement. QED is the leading international supplier of air-powered pumping systems for LFG well dewatering and leachate pumping and LFG flow control products. QED's emphasis is on innovative products that reduce the total cost of ownership through ease of use, long-term durability and technical superiority. Recently, QED partnered with Sage Metering to develop a customized version of Sage's Prism, a battery-powered portable thermal mass flow meter, to be used in LFG collection systems. The QED Precision Landfill Gas Flow Meter overcomes all of the problems associated with traditional flow measurement devices. It also provides a direct reading of gas flow rather than a calculated value, corrected for temperature and humidity. The technician simply inserts the probe into the flow path through an access port attached to the pipe, selects the correct pipe size and gas mixture calibration "channel", and a flow rate in cubic feet per minute (SCFM) is displayed. Best of all, once the reading is taken and logged into the Prism's memory, the probe is removed from the access port – there is no flow restriction, and the probe isn't exposed long term to potentially corrosive trace gases and humidity. Data stored in memory can be easily uploaded to an Excel spreadsheet or to a site's database. Initial users have recognized time savings by eliminating the need to change orifice plates with varying flows and more accurate measurements. The QED Precision Flow Meter is a better approach for managing LFG well operations.