

## Guidance on Methane Gas Monitoring

**Regulatory Reference.** Oklahoma Administrative Code (OAC) 252:515-15 Methane Gas Monitoring and Control.

**Applicability.** All new and active Municipal Solid Waste (MSW), Construction and Demolition (C&D), and other land disposal facilities that receive waste with the potential to generate explosive gases. In addition, land disposal facilities in the post-closure monitoring period may be required to develop and implement an explosive gas remediation plan if generation of explosive gases is shown to create a hazard to human health or the environment.

**Purpose.** To provide guidance regarding the sampling of gas monitoring probes at land disposal facilities in accordance with OAC 252:515-15.

**Technical Discussion.** Landfill gas primarily consists of methane (CH<sub>4</sub>) and carbon dioxide (CO<sub>2</sub>) that is formed as a byproduct of bacteria breaking down organic matter in waste. Methane is lighter than air and can migrate through the subsurface off-site or into the atmosphere. Methane is a concern at landfills due to its explosive potential.

### Sampling Frequency.

In accordance with OAC 252:515-15-3(c), explosive gas monitoring shall be performed a minimum of once every calendar quarter.

### Sampling Equipment.

Many types of instruments can be used to sample methane gas at landfills. Instruments will typically measure on the Lower Explosive Limit (LEL) scale or by volume of methane. Instruments that measure on the Lower Explosive Limit (LEL) scale only typically detect up to 100% of the LEL or 5% by volume. When methane exceeds the LEL (or 5% by volume), determining the exact amount of methane can be problematic if an instrument with an LEL scale is used. Therefore, DEQ recommends using an instrument which measures methane by volume up to 100% to give more complete information, particularly when methane exceeds the LEL.

In accordance with OAC 252:515-15-3(d), sampling shall be conducted with a gas measuring instrument that has been calibrated immediately prior to beginning each sampling event.

### Sampling Procedures.

- 1) Once the instrument is calibrated and warmed up as directed by the manufacturer, connect the instrument to the gas probe as follows:
  - For gas probes with a sampling port: open the sampling port and immediately connect the instrument intake or sampling line.
  - For gas probes without a sampling port: open the probe's cap and immediately insert the instrument intake or sampling line and seal the cap in some fashion. Purging or venting gas to the atmosphere prior to (or during) sampling is not an acceptable procedure and invalidates the instrument reading.

- 2) Withdraw gas from the probe using the instrument's pump until the instrument reading stabilizes. A stabilized reading is one that does not vary more than 0.5% by volume.
- 3) Record the stabilized reading. Other relevant information that may be recorded include: the length of time gas was withdrawn, weather conditions, and issues (if any) with the physical condition of the probe.

**Reporting.**

All gas monitoring events shall be documented and the results reported to DEQ and maintained in the facility's operating record.

In accordance with OAC 252:515-15-2, the concentration of methane gas shall not exceed:

- 1) 25% of the Lower Explosive Limit (LEL) for methane in all structures within the permit boundary (excluding gas control or recovery system components); and
- 2) The LEL for methane at the permit boundary (i.e. in the perimeter gas probes).

If methane levels detected exceed item 1 or 2 above, the owner/operator shall follow the procedure outlined in OAC 252:515-15-5(a).