

# Fixed-Point Laser (FPL) Monitoring Method for Methane Emissions

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**Background/Objectives.** Utilizing tunable diode laser absorption spectroscopy, the FPL monitor has proven to be a reliable and accurate performer in the field for measuring methane concentrations during three case studies in California and Texas despite adverse weather conditions.

A Class IIIa laser was used to emit a beam of light through a plume of methane gas. One specific wavelength in the beam was absorbed by the methane molecules in the path of the beam. The amount of laser light absorbed was proportional to the amount of methane in the path of the beam.

**Approach/Activities.** The first case study in San Antonio, Texas at a research facility utilized controlled methane releases within a short distance between the optical transmitter and reflection plate. The second case study in Livermore, California at a utility gas leak training facility included baseline emissions and methane releases and other surrounding emissions from industrial sources. The third case study in Los Medanos, California at a utility gas storage facility also included baseline emissions and increased methane concentrations during peak system demands.

The FPL monitor was commercially deployed at a utility gas distribution regulator station for continuous monitoring in real time. Information gathered provided background data on leaks that could be used to model when and how often to expect leaks at similar stations.

**Results/Lessons Learned.** Utilizing the FPL method to monitor methane emissions will provide results over a given area in less time than the current method of using on-site personnel to spot check several points in the same area. In addition, the technician using this FPL method reduces his exposure to potentially harmful gas. The FPL system includes the ability to stream analytics and site data in real time via cellular for reliable remote viewing.

Industries that will benefit from the data gathered by the fixed-point laser system include landfills, biogas operations, renewable natural gas, wastewater treatment facilities, and other similar facilities.