Discover Advanced Mobile Leak Detection (AMLD)

Residential Methane Detectors

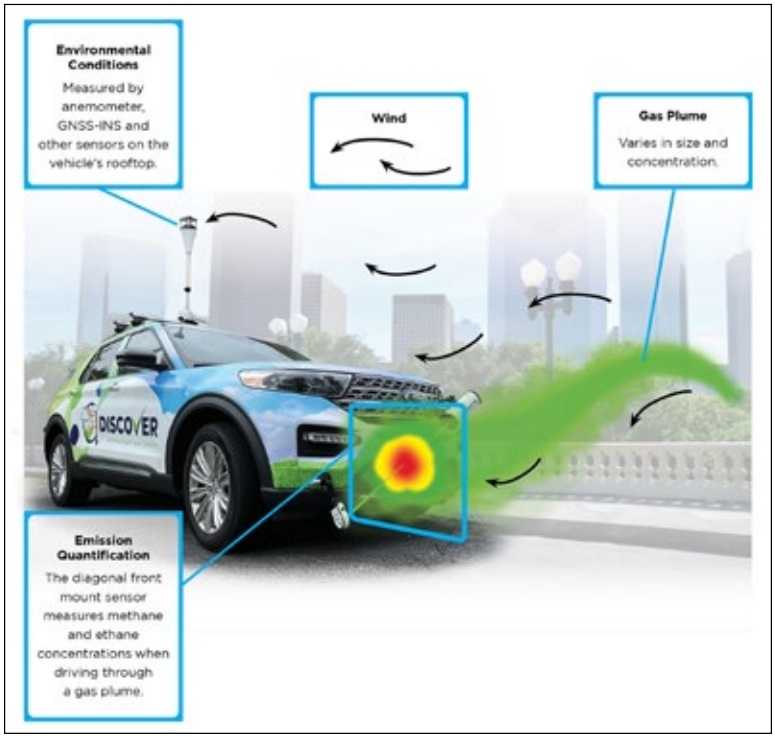
By: Paul Wehnert, Heath Consultants

Pressure continues throughout the World against fossil fuels; in the case of natural gas, it is the fear of methane emissions, a major component in natural gas and a greenhouse gas (GHG) as a contributor to climate change. Natural gas companies are under constant scrutiny to reduce methane emissions from the wellhead through gas gathering, processing, transmission, distribution and up through and including the customer burner tip. The issue is two-fold, as methane emissions through leaks and other operational processes create concerns for public safety in addition to lost and unaccounted-for revenue losses.

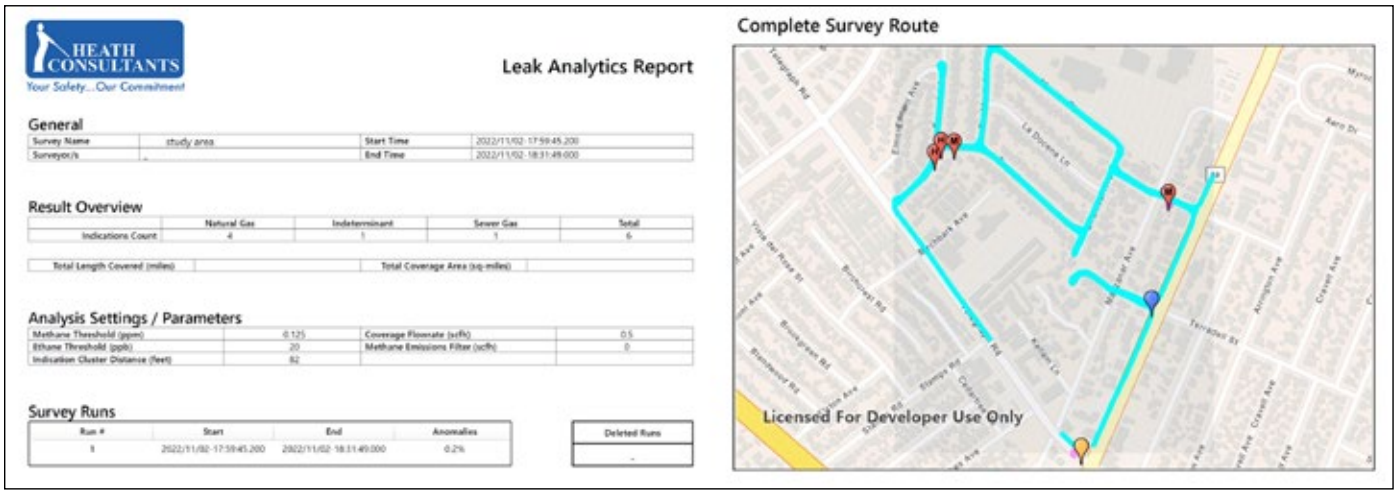
Gas companies have always conducted natural gas leak detection surveys primarily using portable technologies with sensitivity requirements in the parts per million (ppm) detection range and carried by the person as they walk the pipeline assets. Surveys are generally done on a time requirement, whether it be annual, 3-year or a 5-year inspection, based on State and Federal regulations. Natural gas is also odorized with a distinct odor. In the event of a gas release, the public can smell it and notify the appropriate authorities. Thus, between scheduled compliance leakage surveys and customer leak and odor calls has been a proven approach to reducing leaks within a pipeline network.

New requirements in Federal Regulations – Pipes Act has now required Advanced Leak Detection Technologies, which generally can detect leaks in the parts per billion (ppb) range and are much more sensitive than previous technology. These systems, including the Discover Advanced Mobile Leak Detection (AMLD), allow a Utility to patrol their pipeline assets with a street or offroad vehicle and provide a much larger coverage area than conventional walking or legacy mobile

Discover AMLD



Gas plume detection



Leak survey documentation

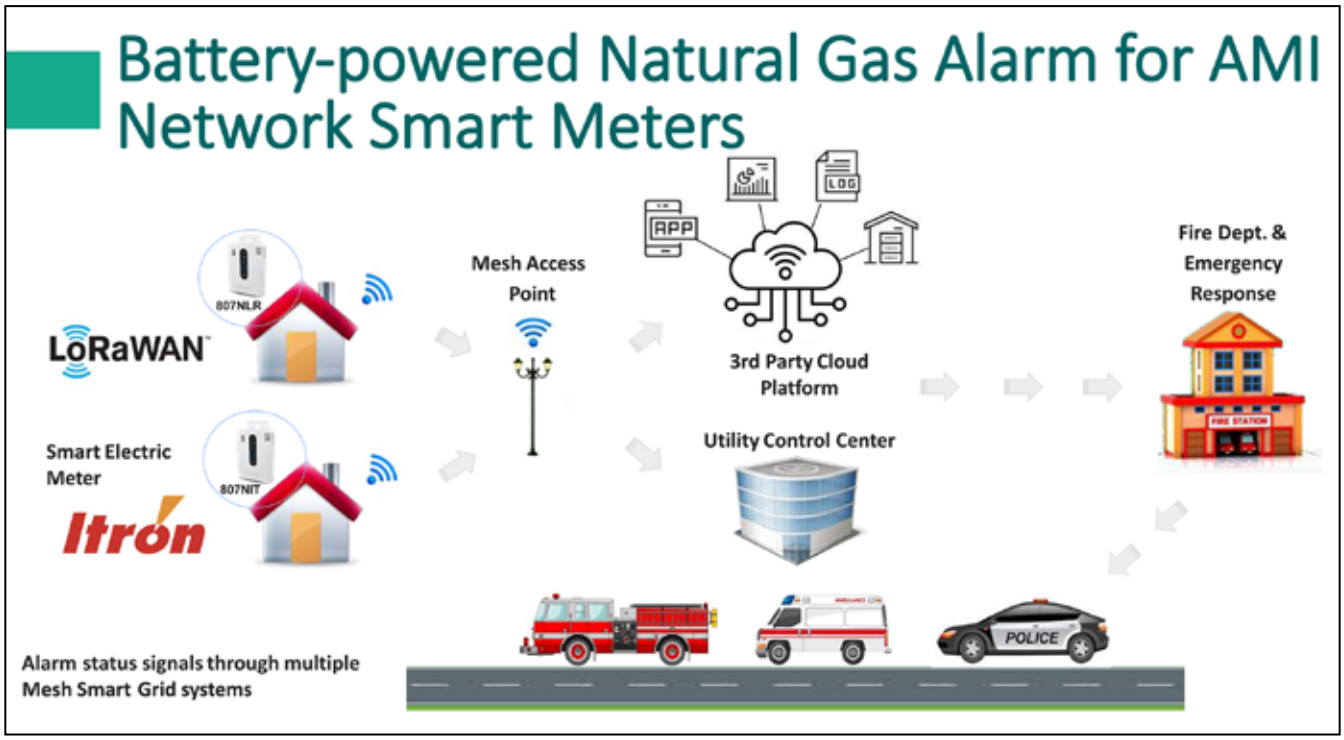
patrols. Sophisticated software with Geographical Information System (GIS) now provides a utility with coverage maps, heat maps, indications, etc. and can be performed at much faster speeds allowing more frequent inspection as part of Distribution and Transmission Integrity Management (DIMP/TIMP) programs. This system can also differentiate pipeline gas from naturally occurring methane such as marsh, swamp, landfill, and sewer gas by also detecting ethane found in pipeline gas – thermogenic gas but not in short-term decomposition gas.

The technology in the Discover AMLD operates with Tunable Diode Laser Adsorption Spectroscopy (TDLAS) and deploys two (2) lasers mounted on the front of a vehicle for both methane and ethane. This allows for instantaneous response and analytics done with cloud computing for analysis and record keeping. Under integrity management programs, utilities need to understand the risk associated with their assets by pipe age, pipe material, pipe construction, pipe pressure, and pipe location and allows a process to survey those assets more frequently. This also happens with activities outside of a utility's control, such as construction activities, open excavation and directional boring, and environmental effects like earthquakes, floods, fires, heavy snow, and hurricanes on pipeline assets. Legacy assets are being replaced at a tremendous rate as part of aging infrastructure replacement programs for public safety and the prevention of methane emissions to the atmosphere.

Residential Methane Detectors are another vital opportunity to be installed indoors at residences and commercial buildings to detect leaks on inside piping and gas migration into a structure from outside leaks. The detector will alarm if the indoor atmosphere is at 10% LEL. As mentioned previously, not all the public will call when they smell the odorant added to natural gas as some have issues with their sense of smell or believe someone else will make the call, then come to find that nobody makes the call. These detectors are an added layer of protection. If a homeowner does or doesn't smell the leak, the alarm will sound and let them know of the potential danger. Another added feature is the ability have the devices connected to an automated meter infrastructure (AMI), the communication protocol that currently reads gas, water, and electric meters. If the alarm sounds, the customer is notified immediately, the gas utility receives a signal directly and can dispatch a service technician to the property for further investigation.

Most catastrophic leaks are caused by third-party damages by contractors/

Survey route (turquoise), coverage area (green) leak indications (purple)



Communication depiction of gas alarm to the gas utility

excavators and the general public digging around natural gas utilities without calling the National 811 number to have utilities come out and mark their assets before excavation. Calling 811 is extremely important and the law which is designed to eliminate potential loss of life and property. The fact is, we can now patrol piping networks with more frequency using the Discover AMLD and have connected natural gas leak detectors inside residential and commercial properties to provide several more layers of protection for public safety and the reduction of natural gas/methane as a greenhouse gas (GHG) emission.

Residential methane detector installed in basement at gas meter location

ABOUT THE AUTHOR:

***Paul Wehnert** is the Executive Vice President/Chief Marketing Officer at Heath Consultants with more than 40 years of natural gas industry experience. He has been instrumental in the development of technical advances in the fields of leak detection, odorization and underground locating technologies. Paul frequently presents papers and provides instruction for private, municipal and investor-owned utilities, numerous government and regulatory agencies and state and regional gas associations around the World. He represents Heath as a member of state, regional, national and world gas associations and committees.*