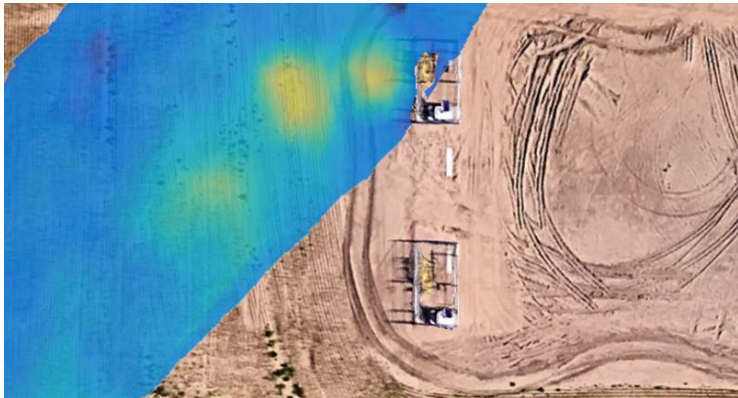




# METHANE MONITOR



Methane Monitor captured this fugitive emission from a production well. Peak concentrations are about 70% (350 ppm-m) above the ambient background methane (data with interpolation, by post processing).

Ball Aerospace's Methane Monitor quickly and easily identifies indications of excess atmospheric methane by:

- Using laser-illumination remote sensing techniques to measure atmospheric methane concentrations from an airborne platform.
- Geo-locating and fusing concentration data and imagery, providing an easy to interpret, graphical overlay of plume images.
- Leveraging over 50 years of remote sensing expertise for NASA, NOAA, the U.S. Department of Defense and commercial companies including Landat's Land Imager.

## ADVANTAGES

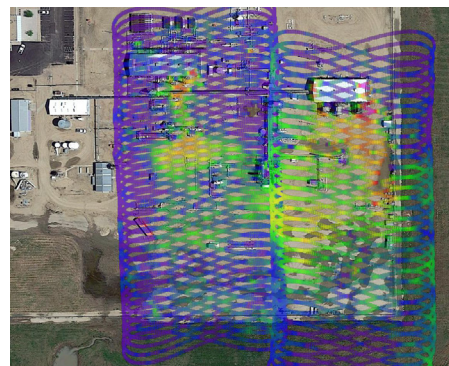
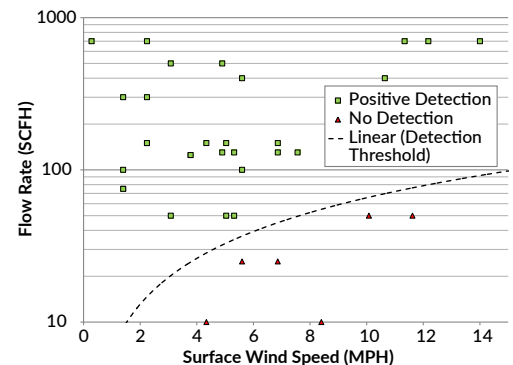
- **Lower-Cost:** Employs single-engine, fixed-wing aircraft operating at 1,500 - 4,500 ft. above ground level, thereby reducing operating costs and improving safety, as compared to helicopter-based sensors
- **Reduces false-positive indications:** Graphical imagery identified sources by imaging the shape and contours of a gas plume, distinguishing sources that are off-system, from sources within operators' assets
- **Timely results:** Real-time, on-board data processing allows facility operators to be alerted immediately of large emission sources. Full reports provided within a few hours of the end of the survey flight.
- **Precision:** Automatically targets and scans designated assets; mitigating effects of aircraft motion and imprecise navigation while geo-locating concentration data. Automatically flags where survey targets are missed for reporting and re-flight planning.

## CHARACTERISTICS

PARAMETER	PERFORMANCE
Operating Wavelengths	Near-infrared, around 1,650 nm
Sensing Swath	40 m to 200 m *
Ground Speed	55 m/s (130 mph)
Altitude	500 m to 1,000 m (1,650 to 3,300 ft) above ground level *
Methane Sensitivity	~50 ppm-m above background, single path from air to ground. See "Performance" graphic to correlate chemical sensitivity to leak rate.
Spatial Resolution	<2 m
Geo-location Accuracy	<2 m

\* Depending on customers' survey objectives.

Nominal performance: emission rate vs wind speed scatter-gram shows detection threshold.



Large indication of emission from natural gas handling facility readily captured. (Real-time data without interpolation. Highest concentrations exceed 5,000 ppm-m above background, double-path)

## GO BEYOND WITH BALL.™