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How WM Is Advancing Methane Measurement at Landfills

Drones, sensors and satellites are redefining how emissions are tracked

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At WM's closed Petrolia Landfill in Ontario, Canada, a one-of-a-kind research effort is underway to test how new and emerging technologies perform in real landfill conditions. Drones, fixed sensors, aircraft, satellites and advanced analytics are all being evaluated to better understand what works best to detect methane gas.

And this work is about improving the science behind how landfill methane is measured — not just for WM, but for the entire industry.

"WM is committed to developing and adopting useful technologies that can improve how we work and help us better serve the communities where we operate," said Bryan Tindell, vice president of disposal operations at WM. "This is a shining example of how we act on that commitment."

How Methane Emissions Are Measured at Landfills

Landfills are dynamic environments. Weather, terrain, time of day and seasonal shifts can all influence where and how emissions appear.

"There's no silver bullet for detecting and quantifying landfill methane," said Amy Banister, senior director of air programs at WM. "That's why controlled studies like this are so important — they help us understand which technologies truly work in a complex, real-world environment."

As remote sensing tools continue to evolve, improving how emissions are measured, validated and managed is becoming increasingly important for operators across the industry.

A Globally Recognized Methane Research Site

Petrolia is one of the few controlled methane-release research sites in the world — and the only one at a landfill.

Because it's a closed landfill with very low baseline emissions, researchers can release methane at precise, known rates. Participating universities and technology providers then test their tools without knowing those rates, making accuracy and performance straightforward to evaluate.

"At most landfills, you can't know the true emission rate," said Roger Green, director of engineering science at WM. "At Petrolia, we can. That's what makes it a world-class research site and why global vendors keep coming back."

The site has attracted researchers and technology vendors from across the United States, Canada and Europe, including Germany, France, Denmark, Spain, Sweden and the United Kingdom. Their work takes place at the [Simulation Facility for Landfill Emission Experiments](#) or SIMFLEX, a controlled-release research facility at the Petrolia Landfill.

Dozens of detection systems have been tested, including:

- Drone-based monitoring systems
- Aircraft and satellite platforms
- Truck-mounted detection tools
- Fixed sensor networks
- LiDAR and laser-based systems
- Modeling and analytics tools

Each technology performs differently depending on wind, weather and terrain — underscoring why no single tool is the answer and why a combination of tools is needed.

These studies are made possible through close collaboration with academic and research partners. FluxLab at St. Francis Xavier University leads the planning, coordination and analysis of the controlled-release work, with Florida State University also contributing to study design and data interpretation. This independent research is funded by the Environmental Research and Education Foundation (EREF), supported by waste industry partners, and by Natural Resources Canada (NRCan). Their scientific leadership helps lend credibility to the results with regulators, technology developers and landfill operators.

WM Is Participating — Not Just Hosting

In addition to hosting the study, WM entered its own methane-detection drone system alongside independent research teams to evaluate internal capabilities under the same rigorous conditions other vendors faced.

"We are leaders in this space," Banister said. "The only way to do that is to test, validate and understand these tools ourselves — not just adopt technology, but help shape how it's used across the industry."

Results from the winter campaign are expected later this year after university analysis is complete.

Informing the Future of Regulation

With agencies like the U.S. Environmental Protection Agency (EPA) and several states examining how remote sensing could be used in landfill rules, reliable science is essential.

"These studies will ultimately support better regulatory standards," Banister said. "If remote sensing is going to play a role in compliance, it's critical that the methods are accurate, reliable and practical in real landfill conditions."

A Focus on 'Find, Fix, Manage'

Everything happening at Petrolia ties back to WM's broader approach to sustainability and [responsible landfill management](#).

"This work directly supports our sustainability goals," Banister said. "It's about finding emissions quickly, fixing what needs attention and managing our landfills as responsibly as possible."

Behind the scenes, WM's field teams played a crucial role.

"This kind of study doesn't happen without people willing to collaborate, problem-solve and put in the time," said Megan Wilson, senior manager of emission measurement & response, drone technology at WM. "From permitting and logistics to flying drones in winter conditions, teams across WM came together to make something complex work — and that's what made it so rewarding."

Leading the Future of Methane Measurement

Today, satellites and aircraft can capture images that didn't exist even a few years ago — and communities and regulators are watching.

"What used to be invisible is now visible," Banister said. "With satellites and aircraft capturing images, communication with the community is more important than ever — and we take that seriously."

WM is helping lead the conversation by combining operational expertise, scientific research and global collaboration, to shape the future of landfill methane measurements. The work at Petrolia shows that leadership isn't just about meeting standards — it's about helping define them.

<https://mediaroom.wm.com/2026-05-29-How-WM-Is-Advancing-Methane-Measurement-at-Landfills>