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STRIVE

SUMMARY OF FINDINGS

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Monitoring of gas emissions at landfill sites using autonomous gas sensors

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This project developed a gas monitoring platform capable of autonomously extracting, measuring and communicating the concentration data of CO_2 and CH_4 present in a borehole well. Transmitted data were stored on a database, which was queried by and presented through a web-based user interface. This project was funded by the Environmental Protection Agency (EPA).

Background

The current sampling frequency at perimeter borehole wells on landfill sites is labour intensive and on occasion may not provide a full picture of landfill gas concentration and fluctuations. A less labour intensive method of sampling and measuring with increased temporal resolution is essential to effectively and efficiently manage these sites.

Key Points

- During this research project a fully autonomous landfill gas monitoring platform, capable of extraction, measurement and communication of gas concentration data was developed and validated.

- This gas platform has been validated on a landfill site through monitoring of CO_2 and CH_4 concentrations, however, the platform can be easily adapted for other gas targets such as SO_x, NO_x, H_2S, CO and VOCs.

- For continuous (daily) monitoring of the landfill site, the extracted sample should be recycled back into the borehole well during measurements.

- The sample should be extracted from a depth within the borehole well headspace and not from the top, where ambient air can dilute the sample. The headspace depth is dependent on the water table but a sample extraction depth of 0.5-1.0 m has been shown to be effective.

- An extraction time of 3 minutes at a flow rate of 0.6 L/min adequately provides a representative steady-state sample of the extracted gas.

- Sampling should take place more frequently, at least once per day, to provide the necessary information to make informed decisions on-site with regard to gas management system effectiveness and efficiency.

For Further Information

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The full report *Monitoring of gas emissions at landfill sites using autonomous gas sensors* by Breda M. Kiernan et al. Is published by the Environmental Protection Agency and is available from link http://www.epa.ie/downloads/pubs/research/tech/name,28454,en.html