

Mitigation of an Orphan Well Leaking Methane in a Residential Area

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Eighty years after it was drilled, the Tenwell No. 1 well was found by the Orphan Well Association (OWA) to be leaking fugitive gas in what is now a residential area of Vermilion, AB. Proximity to houses limited options to seal the well downhole and the presence of methane in the gas presented a risk. Isotopic analyses indicated that the oil-related natural gas was from the Colorado Formation. Methane was found to have migrated through the soil within approximately 8 m of the well at concentrations exceeding the lower explosive limit (LEL) and methane soil gas efflux rates as high as $230 \mu\text{mol-CH}_4 \text{ m}^{-2}\text{s}^{-1}$. To control the potential risk, an Active Methane Mitigation System (AMMS) was installed and operated continuously for 1.5 years. The system was effective at extracting gas from the soil, directing it away from the nearby houses. The OWA then perforated an intervention casing in the well, successfully directing gas flow to a surface vent stack. Gas concentrations in the soil have since remained low enough that the AMMS has been shut down and kept at the site as a contingency.

Matt Neuner

Matt Neuner is a geochemistry consultant with 15 years of experience and holds degrees in geology and hydrogeology. With Golder, he is responsible for developing geochemical and hydrogeological conceptual models, managing collection of reliable field measurements, and modelling geochemical processes. Matt has also designed field and mesocosm experiments for waste rock and tailings at various types of mine sites and helped design soil gas extraction systems. Some recent projects have focused on geochemical assessment of tailings and aquifers of the Athabasca oil sands area, gas release from bitumen to a planned subway tunnel in Los Angeles, assessment and mitigation of a leaking gas well, investigations of sub-permafrost groundwater systems, and instrumentation of waste rock and oil sands tailings to measure infiltration, water quality and seepage.

Gillian Roos

Gillian Roos is an environmental engineer with Golder with 17 years of experience in environmental and hydrogeologic projects. She holds degrees in civil and environmental engineering. Experienced in communication approaches with regulators and in multi-stakeholder scenarios, Gillian specializes in soil vapour intrusion and manages large-scale multi-disciplinary projects and provides technical direction for contaminant assessment and hydrogeological characterization in support of risk assessment and practical risk management strategies. Some recent projects have included investigation of the role of sewers in vapour intrusion into a series of houses, assessment and mitigation of a leaking gas well, construction dewatering requirements for subway tunnel construction in Toronto, and management of legacy impacts for a redeveloped landfill.