

Project Profile

Project Name:	Understanding Fugitive Methane Oxidation in Natural Soils of British Columbia (Phase 3) (Heriot Watt University)
Project Number:	ES-Wells-2025-01
Proponent:	Dr. A. Cahill, Heriot Watt University
Funding Envelope:	Engineering and Safety Research—Wells
Timeframe:	September 1, 2024 to April 30, 2026

Project description

This project is a continuation of two research investigations that are enhancing our understanding of the integrity of decommissioned wells and the implications of fugitive gas leaks in B.C. The project comprises three parts:

- Part 1--examine seasonal variations in methane oxidation in natural soils (e.g., spring and fall) and compare to relatively high rates of oxidation observed in summertime.
- Part 2--conduct an environmental risk assessment and management strategy appraisal for low leakage, integrity compromised wells to determine potential environmental risks, impacts and optimum management strategy(s).
- Part 3--disseminate knowledge on well integrity failure and fugitive gas leakage in BC to stakeholders at the Regulator (BCER), BC Government and industry along with local college and Treaty 8 First Nations. Workshops/seminars around well integrity failure and fugitive gas release may be delivered--in person and/or on-line with potential field demonstrations.

Project objectives

The objectives of this project are to:

- Enhance knowledge of well integrity failure and fugitive gas leaks by considering seasonal variability in extents of methane emissions and soils-based oxidation.
- Disseminate learnings and knowledge on integrity compromised wells and fugitive gas leakage in B.C.

Project approach

The project will consist of the following three phases:

1. Field investigations examining seasonal variation in methane oxidation.

Carry out extensive monitoring/sampling at wellsite(s) previously examined during the summer season with investigations in both spring and fall seasons. Data gathered will contribute towards

understanding the potential extents and rate of methane oxidation throughout the differing seasonal conditions. In addition, the collected data will be used to further understand which parameters are the dominant control(s) on the extents and rates of oxidation of methane in soils.

2. Risk assessment and management strategy appraisal.

Conduct a site-specific environmental risk assessment and management strategy appraisal for the wellsite(s) showing methane oxidation in natural soils—identifying the optimal management strategy for the well based on its specific leakage in comparison to the risks and impacts of remedial action. This analysis will help evaluate the potential options for managing well sites with methane leakage.

3. Knowledge building on well integrity failure and fugitive gas release in B.C.

Design and deliver a series of knowledge dissemination events/activities to enhance knowledge on the science of well integrity failure and fugitive gas release.

Project deliverables

The deliverables from this project include the following:

1. Project Technical Report.
2. Workshop(s)/seminar(s) on well integrity failure and fugitive gas release..