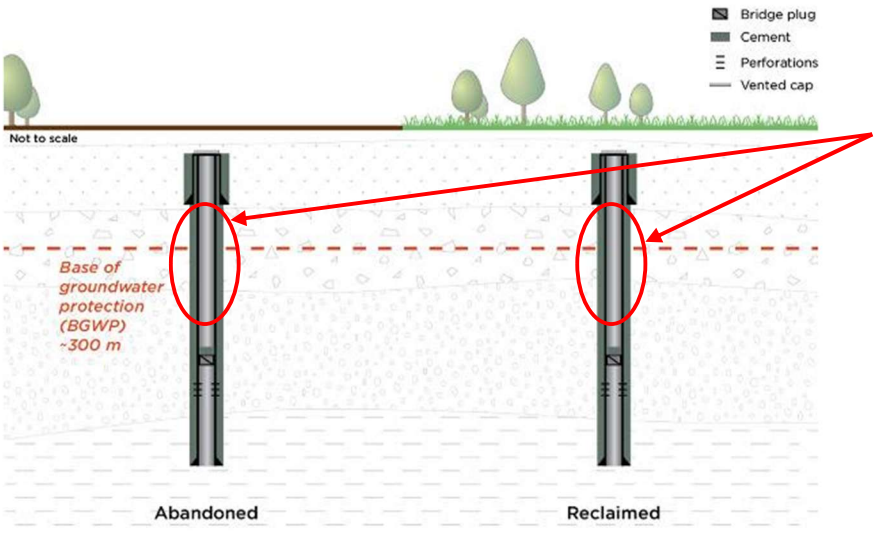
Introducing the SynBioBlox Methane Biosensor
for Abandoned and Inactive Wells

The Problem:

- About 170,000 abandoned and inactive wells exist in Alberta, representing 37 per cent of all wells in the province.
- There are more than 400,000 non-producing oil and gas wells in Canada, which represent more than 70% of all oil and gas wells in the country.
- In the US, more than 3.2 million abandoned oil and gas wells together emitted 281 kilotons of methane in 2018.
- In 2020, a Reuters investigation estimated there are 29 million abandoned wells internationally.
- Studies in the US and Canada have shown that abandoned wells contribute a substantial amount of overall methane emissions from the oil and gas industry, with some research suggesting they contribute a percentage of total methane emissions from oil and gas activities between 22-49% in the US and 13% of total fugitive emissions in Canada.
- In a January 2024 report, the Alberta Energy Regulator said the cost of cleaning up the province's 466,000 licensed wells would be $33.3 billion, or roughly $71,500/well.
- Abandoned wells in Alberta are located throughout the province, often in areas where oil and gas development has occurred. They can be found in various locations, including forests, backyards, farm fields, and even under sidewalks and houses.

The Solution: The SynBioBlox Downhole Methane Biosensor



Biosensor Installation

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- **Initial Application**
  - Abandoned and inactive wells.
- **Location**
  - Proactive emission localization: early detection of methane leaks at the emission point source.
- **Sensor Description –** dormant bacteria awaken when exposed to methane …
- **Sensitivity**
  - Limit of Detection - detects leaks under 1 g/h (recommended requirement).
  - Background atmospheric methane concentration is typically 1.9 ppm.
- **Response**
  - Continuously monitors for methane emissions 24/7.
  - Once activated, the bacteria can detect methane within 60 seconds.
- **Longevity and Reliability**
  - 6-year, maintenance-free lifespan, designed for >95% uptime.
- **Simplicity**
  - Base solution has no moving parts, no maintenance required.
  - Electrochemical biosensor with direct methane measurement.
  - Designed to operate with no power source, using passive RFID.
  - Optional
    - Connection to LTE cellular network and powered by solar panels.
    - Cloud Interface
      - Integrated with other measurements in a methane digital platform, such as aerial, satellite, and ground-based solutions to provide continuous system health monitoring.
      - Real-time alerts, 24/7 emissions monitoring
- **Cost-effective Solution**
  - Expected to be less than $2000 / device