

## Wellbore Leakage Intervention Strategy

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### Summary

Historically, wellbore leakage intervention has been executed with minimal planning, which usually results in ineffective fugitive gas migration isolation. Efficacy of the intervention is influenced by accessing adequate information and program development by a multi-disciplinary team.

Current industry practice is to assess source rock, cap rock, fluid movement and escape path of the wellbore leakage, but with minimal to no data collection effort. An intervention strategy using appropriate technology to collect the necessary information for a successful intervention must be applied to ensure the origin and remediation of wellbore leakage is addressed in a comprehensive, effective and efficient manner. A collaboration effort between all parties involved will improve the likelihood of a successful remediation on the first attempt.

Patience must be practiced when creating the intervention strategy. Quick turn-around time to save on rig cost can be a limiting factor for interpretation quality and again leads to intervention failure. Multiple interventions can result in remedial costs reaching into the millions of dollars on a single well.

This presentation documents a successful intervention strategy for a problem well in the Wainwright/Wildmere area.

### Introduction

Wellbore leakage, often referred to as surface casing vent flow (SCVF), gas migration (GM) or sustained casing pressure (SCP) has been an issue since the beginning of the oil and gas industry. Public concern for ground water contamination and greenhouse gas emissions has encouraged regulators to introduce testing for leaks. Provinces and Territories have different regulations; however all require remediation prior to reclamation. Current regulations do not specify best practices for intervention success.

### Theory and/or Method

A properly designed, scientific process to resolve wellbore leakage will lead to higher intervention success rates. A successful six-step approach includes:

1. Thorough investigation
2. Accurate source identification
  - a. Source rock
  - b. Fluid movement
  - c. Escape path
3. Robust intervention strategy
4. Confirmed source access
5. Quality cement squeeze
6. Monitoring

### Examples

Presented is a case study on a problem well in the Wainwright/Wildmere area that had multiple unsuccessful interventions.

## Conclusions

Successful intervention is dependant on:

- Communication
  - Knowledge shared between all parties to ensure proper intervention planning
- Correct application of technology
  - Identify the right technology to use in different environments
    - Geographic location
    - Flow rate
    - Casing/well specifications
- Scientific process
  - Document and execute procedures for repeatable success

## References

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