Shallow Operations Issues

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Principles

- containment
- groundwater protection
- surface impact minimization
- good engineering practices
  - shallow operations can be “high risk”
Issue Identification

- Gas development becoming shallower
- Closer proximity to water wells
  - Potential for conflicts with groundwater increase
- Higher density of wells
  - Potential for conflicts over surface use increase
- Increased attention and engineering in shallow operations important
Drilling

- Use of non-toxic drilling fluids
- Attention to testing offset water wells
- Potentially require Alberta Environment preliminary groundwater assessment
  - produced water < 4000 ppm TDS
  - shallow wells require pre-planning
Completion & Stimulation

- Attention to cementing casing to base of groundwater protection
- Attention to prevent the mixing of water qualities (commingling)
- Shallow fracture containment within zone
  - Fracture pressure
  - Lithology dependencies
- Best engineering practices for shallow fracs
Re-completion & Abandonment

- Re-completions
  - Wellbore (casing & cement) integrity
    - potential for migration
    - casing integrity & cement bond logs
  - Abandonment of commingled wells
    - cement entire perforated interval?
Where do we go from here?

- Proper engineering & design
- Industry best practices
Thank you!