

## BC OGRIS Project Profile

Project Name: Deep Aquifer Fluid Disposal  
Project Number: EI-2016-04  
Proponent: Geoscience BC / Canadian Discovery Ltd.  
Funding: Environmental Impacts  
Envelope:  
Project Dates: June 1, 2015 to August 30, 2015.

### **Project Description**

Natural gas exploration and development in northeast B.C. require large volumes of water. This water is needed to access the natural gas locked within tight shale rock reservoirs during a process called hydraulic fracturing, or "fracking." This process releases the gas and/or oil by creating spaces in the otherwise tight reservoir that allow the gas to flow.

In utilizing large volumes of water to access shale gas, large volumes of "produced" water are created and have to be disposed of and stored in a safe and sustainable manner. To ensure no contamination of drinking water, these produced waters must be injected into deep aquifers known as disposal zones.

The Deep Aquifer Fluid Disposal, or DAFD project, will characterize the capacity of deep disposal zones within the Montney unconventional play fairway in northeast B.C. Petrel Roberston Consulting Ltd. (PCRL) was contracted to perform Phase 1 of the DAFD project, which includes mapping and characterizing three different deep saline aquifers identified as high-priority disposal zone targets.

Canadian Discovery Ltd. Was engaged to perform Phase 2 of the DAFD project. This will involve a focused assessment of aquifer hydrogeology, including projections of the capacity of the aquifers to accept produced fluids.

### **Project Deliverables**

Phase 1:

1. Graphic core logs (presented in WellCad format) and graphic sample description logs.
2. A grid of regional cross-sections establishing and illustrating relevant regional stratigraphy.
3. A suite of regional maps on the Belloy, Kiskatinaw, and Debolt, including structure, depth to formation, gross isopach and net porous reservoir maps.
  - A stratigraphic database will be provided in spreadsheet format, and will be made available to Canadian Discovery to ensure consistency of stratigraphic treatment.
  - Existing and potential hydrocarbon pool locations will be highlighted.
4. Additional maps, as required, to fulfil goals listed above – exploration/exploitation in bounding units and in deeper potential reservoirs; presence of structural features with seismic risk potential.
  - A summary map will be presented to highlight the high/medium/low favourability areas for the target aquifers.
5. An interpretive text, including an analysis of results and recommendations focused on OGC's requirements.

Phase 2 (covering the new Belloy and Debolt areas of interest):

1. Hydrogeology (as data availability permits)
  - Pressure vs elevation plots
  - Pressure systems map
  - Head maps
  - Total dissolved solids contour maps

2. Geomechanical Characterization

- Drilling experience plots (approx.. 3 per area of interest)
- Summary of stress-induced wellbore failure and natural fracture populations (depending on quality and amount of image log data available)
- Rock mechanical properties from logs and core
- In situ stresses (orientations and magnitudes of the minimum horizontal, maximum horizontal and vertical stresses)
- Mohr-coulomb fault modeling results

3. Final Report

- Discussion of all technical analyses performed including, but not limited to, amount and quality of data analyzed, confidence in or limitations with analysis results and recommendations for future work
- Ranking of specific areas within each area of interest that are mechanically most favourable for fluid injection.

**Project End Date**

All deliverables are expected to be complete by the end of August, 2015.