Project Profile

Project Name:	Establishing Regional Groundwater Chemistry Baselines for Northeast BC to Support Interpretation of Groundwater Analytical Results
Project Number:	ER-Water-2020-02
Proponent:	Dr. Dirk Kirste, Earth Sciences, Simon Fraser University
Funding Envelope:	Environmental Research—Water
Timeframe:	September 1, 2019, to November 30, 2021

Project objectives

The objective of this project is to use existing and newly collected groundwater data from domestic, industry and provincial observation monitoring wells, and conduct a statistical and spatial analysis of the data to inform groundwater assessments in Northeast B.C.

This project links to the BC Government's Scientific Review of Hydraulic Fracturing in B.C. (February 2019):

- Section 3.2.5 Recommendations (Baseline Water Quantity Data):
  - conduct research to quantify cumulative effects of resource development on water quantity and quality.
  - conduct baseline monitoring and interpretation to improve density of data and develop trends, guidelines and thresholds.
- Section 4.2.5 Recommendations (Baseline Water Quality Data):
  - conduct a rigorous geostatistical analysis of groundwater quality.
  - publish data interpreted from private well sampling undertaken by FLNRO.

Project description

This project is designed to develop chemistry "baselines" of regional groundwater in Northeast B.C., that can be used to inform groundwater assessments for a variety of purposes.

This project is an extension of a similar project underway in Alberta and will provide for consistency in methods to establish and document baseline groundwater conditions and shallow gas origins.

The resulting data will allow for GIS based queries on the distribution of baseline attributes.

The Regulator, government and industry will have the ability to identify local natural variations in composition which can be used to inform appropriate monitoring and remediation strategies.

Project approach

The project will involve the following:

- Literature review—of existing similar approaches to develop regional water chemistry baselines in other jurisdictions.
- Parametric and non-parametric statistical analysis of domestic, industry and monitoring well groundwater chemistry databases and other available data in Northeast B.C.
- Identifying gaps in the spatial distribution of records and strategic collection of new data such as standing water levels, water chemistry and dissolved gas chemistry and isotopes.
- Developing spatially defined groundwater chemistry "baselines" including redox state zones for aquifers in Northeast B.C.

Project deliverables

The deliverables from this project include the following:

1. Final Report summarizing the approach, findings and implications.
2. Groundwater Chemistry Data Inventory.
3. Groundwater Baseline Chemistry Map (GIS polygons).