

Project Profile

Project Name:	Storing Saline Fluids in Engineered Liner Systems
Project Number:	EI-2016-05
Proponent:	Higher Ground Consulting
Funding Envelope:	Environmental Impacts
Timeframe:	September 1, 2015 – April 30, 2016

Project objectives

The project will investigate whether construction techniques, environmental changes and how produced water pit structures (PWPS) are operated may affect, impact or cause a weakening to the molecular strength of welds and materials used in their construction.

Potential factors to investigate may include, but not limited to:

1. Extreme heat and cold fluctuations (seasonal changes);
2. Extreme heat and cold fluctuations (seasonal changes) along with addition or withdrawal of saline fluids with varying temperatures;
3. Construction during frozen and un-frozen ground conditions – earthworks;
4. Construction during frozen and un-frozen ground conditions – eosynthetics installation;
5. Hydrostatic head pressure changes; and
6. Substrate and sidewall stability / grade / use of geotextile cushions or sand beds.

This research is intended to close existing knowledge gaps not currently addressed in industry literature, including the BC Oil and Gas Commission’s ‘Management of Saline Fluid for Hydraulic Fracturing Guideline [May 2015]’, CAPP’s Hydraulic Fracturing Operating Practices and the Alberta Energy Regulator’s Directive 55 – Addendum: Interim Requirements for Aboveground Synthetically-Lined Wall Storage Systems, Updates to Liner Requirements, and Optional Diking Requirements for Single-Walled Aboveground Storage Tanks [October 2011].

Project background

In the Western Canadian Sedimentary Basin (WCSB), among the jurisdictions which allow them, lined PWPS are constructed to assist in managing produced water and fracturing flowback fluid returns (i.e. saline fluid). PWPS infrastructure plays a critical role in supporting the hydraulic fracturing process when used for multiple locations throughout a resource play. They allow for a high-volume freshwater sourcing alternative, act as storage and delivery (logistical) hubs, facilitate the re-use / recycling of saline

fluid for future operations and provide a mechanism that increases the potential of inter-operator saline fluid sharing.

PWPS' are an economical asset in meeting, sustaining and ultimately growing production from unconventional resources. Saline fluid can be kept 'in-field', which directly correlates to a significant reduction in tanker truck transport on public/private roads and the elimination of near-term disposal costs.

While the geosynthetics industry applies its own design and specification standards for the products it supplies and installs, certain design specifications for the use in oil and gas applications should be reviewed or established if deemed outside the current industry scope. PWPS' are exposed to extreme environmental and physical changes during operating cycles on a continuous year-over-year basis, elements that may cause stresses not relevant to and/or not encountered in other geosynthetic applications.

Project approach

The project will involve the following activities:

1. Table-top/literature review.
2. Interviews with regulators, industry representatives and engineering specialists.
3. Case study review.

Project deliverables

The deliverables from this project include the following:

1. Final report documenting the findings, conclusions and recommendations.