

June 4, 2018 (Revised)

Reference: News Release – Alternative Salinity Evaluation

SynergyAspen helped improve the environment by solving a decades old problem in our industry. Salt contamination was falsely identified in muskeg due to a lab method and regulatory standard intended for mineral soil, not muskeg. This caused falsely identified salt contamination resulting in unnecessary muskeg remediation. This is bad for the environment and bad for environmental budgets.

The BC Oil and Gas Commission (OGC) now accepts an Alternative Salinity Evaluation as an additional line of evidence to determine sodium and chloride concentrations in organic soils such as muskeg. This approach can be used for Certificate of Restoration (CoR) applications at Upstream Oil and Gas sites.

An accepted alternative lab method (a modified saturated paste) was recommended by SynergyAspen as a result of a research project funded by BC ORGIS. The alternative lab method measures the salt concentration in muskeg pore water. This departs from the standard saturated paste method that measures salt concentrations in muskeg “soil”. The alternative lab method eliminates two major biases as follows:

- 1. Denominator Bias.** Lab results for the standard saturated paste method are expressed as weight (mg) of contaminant (i.e. sodium or chloride) divided by the dry substrate weight (i.e. muskeg). Let’s assume a sample of wet muskeg weighs 1kg, contains 10 mg of sodium, has a water content of 90%, and the density of dry muskeg equals that of water. The reported analytical result would be 10 mg of sodium divided by the weight of dry muskeg (100 mg). The reported analytical result is 100 mg/kg; ten (10) times higher than the actual sodium concentration present in the wet muskeg in the environment.
- 2. Numerator Bias.** Salt dissolves in water. When muskeg samples are collected, salty water is unintentionally and unavoidably lost. Since the standard saturated paste method reports a ratio of mass (mass of sodium or chloride in the sample divided by mass of dry muskeg), salty water lost during sampling can bias low reported lab results. Let’s assume 50% of the salty water within a volume of muskeg was lost during sampling (i.e. the lost salty water never made it to the sample jar). The mass of sodium reported by the lab would decrease by 50%. The analytical result would therefore be one half (or 50%) of the sodium concentration in the environment.

Using the Alternative Salinity Evaluation line of evidence, industry in BC should use the modified saturated paste method and compare these lab results (reported in mg/L) to new proposed guidelines. The new guidelines are a result of a research project completed by Hemmera funded by BC ORGIS. The use of the Alternative Salinity Evaluation as an additional line of evidence may avoid unnecessary delineation and remediation of falsely identified salt contamination in muskeg.

SynergyAspen’s help to solve this problem falls within a broader approach SynergyAspen calls Desktop Remediation™. Desktop Remediation™ is a site-specific risk evaluation using a science-based approach to contaminated sites consulting. We conduct a detailed evaluation of each corner of the risk triangle and determine if contamination is real, exaggerated, falsely identified, or due to background conditions. Over the past 3 years, using Desktop Remediation™ we obtained approximately 1/3 of all CoR Part 1’s in BC, saved our clients over \$20M and averted greater than 85,000 m³ of soil from landfill disposal.

To learn more about how Desktop Remediation™ and the Alternative Salinity Evaluation line of evidence benefits your organization, please contact Daniel Gorsic, P.Chem., CEO (604.803.4665 or dgorsic@synergyaspen.ca).