

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.

Effective April 27, 2018, the BC Oil and Gas Commission (OGC) accepts an Alternative Salinity Evaluation method to determine sodium and chloride contaminant concentrations in organic soils such as muskeg. The newly approved method can be used for Certificate of Restoration (CoR) applications at Upstream Oil and Gas sites in BC.

The approved lab method (modified saturated paste) was recommended by SynergyAspen as a result of our research project completed in 2015 funded by BC ORGIS. The method measures the salt concentration in muskeg pore water. This is a departure from the standard saturated paste method that measures salt concentrations in muskeg “soil”. The new method eliminates two biases:

1. **Denominator Bias.** Lab results for the standard saturated paste method are expressed as mass (mg) of contaminant (i.e. sodium or chloride) divided by the mass of dry substrate (i.e. muskeg). Let’s assume a sample of wet muskeg has a mass of 1 kg, 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 mass of dry muskeg (100 g) which is 100 mg/kg. This is ten (10) times higher compared to the sodium concentration in the natural wet muskeg from which the sample was collected.
2. **Numerator Bias.** Salt dissolves in water. When muskeg samples are collected, salty water is often unintentionally and unavoidably lost. The standard saturated paste method reports a ratio of mass in the sample (mass of sodium or chloride divided by the mass dry muskeg). Salty water lost during sampling can bias low reported lab results. For example, if 50% of the salty water within a volume of muskeg was lost during sampling, the mass of sodium relative to the mass of muskeg in the sample jar decreases by 50%. The reported analytical result is 50% of the concentration in the natural wet muskeg from which the sample was collected.

Using OGC’s Alternative Salinity Evaluation method, industry in BC should use the modified saturated paste method and compare these lab results (reported in mg/L) to new muskeg guidelines. The new guidelines resulted from a research project completed by Hemmera funded by BC ORGIS. The use of OGC’s Alternative Salinity Evaluation method 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 OGC’s Alternative Salinity Evaluation method benefits your organization, please contact Daniel Gorsic, P.Chem., CEO (604.803.4665 or dgorsic@synergyaspen.ca).