

Oil Sands Monitoring (OSM)

Project Name:	W3-1-1 Synthesis and Interpretation of Tributary Water Quality
Type of Project:	Focused Study
Delivery Agent:	Environment and Climate Change Canada
Project Contact:	Patricia Chambers (ECCC) - patricia.chambers@canada.ca
Budget:	\$ 170,302

Project Description:

Under the Canada-Alberta Joint Oil Sands Monitoring (JOSM) Plan, water chemistry was sampled intensively over three hydrologic years (April 2012-Feb 2015) at approximately 14 stations throughout Alberta's oils sands region daily or on alternate days during snowmelt (April-May) and then at decreasing frequency from bi-weekly (June) to weekly (July) to twice monthly (Aug-Oct) to occasionally (three times during ice cover). These water samples have been analyzed for a variety of parameters including anions, cations, metals, nutrients and, for some samples, PAHs. In addition, sondes (a type of automated water quality sampler) were deployed at all sites to record pH, conductivity, temperature, oxygen and water level continuously throughout the year.

The proposed study will analyse the assembled data to quantify and assess the loadings and types of oil sands contaminants in tributaries to the Athabasca River and will support of design of future water quality monitoring programs.

Project Objectives:

- Conduct an analysis of mass balances to identify changes in water chemistry attributable to conversion of land from natural forested/wetland conditions to oil sands mining operations,
- Analyze trends in major water chemistry parameters over time,
- Quantify reference conditions,
- Recommend criteria for inorganic and physical parameters that if reached or exceeded, will trigger management action, and
- Recommend sampling frequency during snowmelt to adequately estimate pollutant loads during this period.

Key Outcomes:

- Regional analyses of contaminants in tributaries to the Athabasca River in relation to mine development.
- Comparison of loads of contaminants in the snow pack to in stream water during freshet in order to determine the extent to which contaminants in the snow pack are transported to proximate streams
- Determination of whether contaminant concentrations are more likely to be toxic when acidic events occur during freshet

Geographic Scope:

As per the Joint Oil Sands Monitoring Plan, the program focuses on 5 tributaries: Ells, Mackay, Firebag, Steepbank and Muskeg rivers. Additional field sampling is not required in the present work plan.

Associated Data and Reports:

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No new data will be collected. All data that will be analyzed as part of this project will be on the OS data portal. Reports include:

- Report on whether contaminant concentrations are more likely to be toxic when acidic events occur during freshet
- Report on the extent to which loads of contaminants in the snow pack are transported to proximate streams
- Report on regional water chemistry criteria (or triggers) that, if exceeded, would suggest a change in water quality
- Report on fluxes of contaminants in tributaries to the Athabasca River in relation to mine development