

Soil Quality Guidelines for Selected Trace Metals

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The Alberta Tier 1 Soil and Groundwater Remediation Guidelines (Alberta Environment and Parks, AEP, 2016) are used for the assessment and remediation of contaminated sites in Alberta; the Canadian Environmental Quality Guidelines (Canadian Council of Ministers of the Environment, CCME, 1999 and updates) are used for Federal Government lands and in several other provinces. Typically, if concentrations of chemical contaminants exceed these guidelines, the contamination requires remediation, risk management, or site-specific risk assessment.

Both the Alberta and CCME soil quality guidelines were derived based on A Protocol for the Derivation of Environmental and Human Health Soil Quality Guidelines (CCME, 2006). This protocol describes the approach, assumptions and models for deriving widely applicable soil quality guidelines that are protective of both human and environmental health. However, some substances, particularly certain metals, have not been evaluated using the CCME (2006) protocol or its 1996 precursor, and are still assessed using prior interim guidelines from 1991. Specifically, antimony,

beryllium, boron, cobalt, fluoride, molybdenum, silver, sulphur, tin and several organic substances (primarily chlorinated organics and phenolics) do not have modern risk-based guidelines.

The purpose of the present work is to develop risk-based guidelines consistent with the CCME (2006) protocol for selected trace metals which occur at oil and gas sites, specifically antimony, beryllium, cobalt and molybdenum.

Policy Issue

Regulatory Guidelines/Directives/Policies/Criteria

Knowledge Gap

Inorganics (salinity, metals)

- Natural salt distribution,
- Fate and transport assessment
- Appropriate protection of various exposure pathways,
- SCARG criteria evaluation
- Risk-based soil quality guidelines for selected trace metals
- Knowledge on background concentrations of inorganics

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