

## **SUDBURY AREA RISK ASSESSMENT**

### **PREFACE**

This Human Health Risk Assessment (HHRA) is a comprehensive study undertaken to evaluate potential human health risks resulting from past and current smelter emissions within the City of Greater Sudbury, Ontario, Canada. A century of mining and smelting activities have resulted in elevated levels of metals and other elements in the soils around Sudbury. The need for a HHRA was identified in 2001 when the Ontario Ministry of the Environment (MOE) confirmed that the concentrations of several elements exceeded the generic provincial soil quality guidelines. Metal levels in soil were particularly elevated near the historic smelting towns of Coniston, Falconbridge, and Copper Cliff, all of which are now situated within the boundaries of the City of Greater Sudbury.

Subsequent soil sampling and comparison with screening criteria identified six Chemicals of Concern (COC) for the HHRA: arsenic, cobalt, copper, nickel, lead and selenium.

The risk assessment has been conducted as an *area-wide risk assessment* (AWRA) rather than a *site-specific risk assessment* (SSRA) for two primary reasons: a) the extensive size of the study area (> 10,000 km<sup>2</sup>) and, b) the involvement of multiple stakeholders, communities, and property owners.

Although the original impetus for this study was elevated metal levels in soils, the HHRA accounts for exposure from many pathways including ambient air, food, drinking water, indoor dust, *etc.* Extensive sampling was undertaken to provide Sudbury-specific data on the concentration of metals in many environmental compartments.

The local ecosystem characteristics of the Sudbury area (*i.e.*, low soil pH, low soil organic matter, *etc.*) are uniquely different from those used in the development of the provincial generic soil quality guidelines. Therefore, this risk assessment is specific to the Sudbury study area. It must also be noted that only potential risks resulting from exposure to metals originating from airborne smelter emissions have been assessed.

Although this is a very comprehensive risk assessment, there are limits to the study. For example, it is not a community health study; a risk assessment of on-site industrial lands, smelter sites, mine tailings or waste disposal areas; an assessment of organic chemicals, mercury or sulphur dioxide emissions; or, an occupational health risk assessment.

The general residents and population of the Sudbury area are the focus of the current study. The purpose of the HHRA is to estimate potential health risks from the chemicals of concern to people visiting, living, or working in the City of Greater Sudbury. These results will therefore, provide a sound scientific basis for determining the need for and potential scope of any risk management activities to be conducted within the area.