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Concentrations of Metals and Other Elements in  
Surface Soils of Flin Flon, Manitoba and  
Creighton, Saskatchewan, 2006

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# **Concentrations of Metals and Other Elements in Surface Soils of Flin Flon, Manitoba and Creighton, Saskatchewan, 2006**

## **Synopsis**

Manitoba Conservation conducted sampling in August 2006 to determine the concentration and potential distribution of metals and other elements in the surface soils of Flin Flon, Manitoba (includes Channing) and neighbouring Creighton, Saskatchewan.

Sample sites included publicly accessible lands such as boulevards, parks/playgrounds, school yards, vacant lots and undeveloped parcels of land in each community. A total of 108 sites were sampled, including 93 sites in Flin Flon, 13 sites in Creighton, a site at Bakers Narrows Provincial Park and a site in Cranberry Portage. The survey was designed and funded by Manitoba Conservation, with assistance from the Saskatchewan government.

The provincial government has been monitoring air and water quality periodically in the Flin Flon area since the late 70's. This study is another step in assessing and protecting the well-being of residents and the local environment.

## **What were the results of the survey?**

Concentrations of several elements, including arsenic, cadmium, lead and mercury, were above recommended Canadian Council of Ministers of the Environment (CCME) soil quality guidelines for human health at a number of sites across the study area. These elements are known to be part of the past and present atmospheric emissions from the Hudson Bay Mining and Smelting Co., Limited (HBM&S) smelter complex in operation for more than 75 years.

The highest concentrations were usually found on undeveloped parcels of land. This may be because smelter particulates have been deposited to the soil surface over a longer period compared to boulevards and parks/playgrounds that have been landscaped more recently. In Flin Flon this included sites in the downtown and adjacent residential areas south of the smelter, as well as in undeveloped areas around the north basin of Ross Lake. The highest concentrations in Creighton were found in the northeast part of the community south of the tailings management area.

### **What do the results mean?**

Given that levels of certain metals and other elements are above the CCME guidelines, HBM&S and the governments of Manitoba and Saskatchewan are undertaking a human health risk assessment with the guidance of a local community advisory committee that will be established.

The CCME guidelines are conservative and based on a scenario of prolonged, year-round exposure for the most vulnerable individuals. A preliminary review of the results suggests that the risk to human health is most likely low, but a more comprehensive human health risk assessment is needed to better and more fully determine this risk.

Private residential yards were not sampled to any extent in this survey. However, since landscaping and maintenance practices are similar, private lawns and yards may have element concentrations comparable to parks/playgrounds and school yards in the general vicinity. The climate of Flin Flon and Creighton likely reduces exposure since the soils in the region are usually covered with snow for a portion of the year.

Studies conducted around other Canadian mining and smelter operations with similar or higher levels of metals and arsenic in the soil have not shown any expected immediate risk to human health. In Sudbury, an ecological and human health risk assessment is currently underway.

The risk assessment will look at the potential health effects of being exposed to metals and other elements in the Flin Flon area. It will assess the likelihood of exposure, the type and severity of risk and what could be done to address any issues identified by the assessment. Analysis of soil samples provides one piece of information to show what is in the environment in the Flin Flon area. Information on metals and other elements in water, air and food along with soil are needed to provide an overall picture of how metals and elements may affect residents. Additional samples will be collected and analyzed to fill data gaps or address incomplete information.

### **How can you reduce your exposure?**

There are a number of steps that may be taken to reduce exposure to metals and other elements in soil including:

- Wash hands after outside activities such as playing and gardening, and before handling and eating food. Wear gloves when working outside.
- Keep children's toys and play areas clean. Remind children to keep their hands out of their mouths when playing outside.
- Remove shoes and boots at the door.
- Use wet-mopping and wet-wiping when cleaning dust in the home, as vacuuming and sweeping can increase dust levels.
- Ensure that the heat ducts and furnace filters are cleaned regularly.
- Brush pets often and outside.
- Wash locally grown garden produce and peel root crops before eating.

### **What are the next steps?**

Hudson Bay Mining & Smelting Co., Limited, the Manitoba and Saskatchewan governments and a soon to be established community advisory committee will undertake a human health risk assessment. Further details will be provided in the months ahead.

In cooperation with Healthy Flin Flon, planning is underway for a public presentation and discussion of the results of the soil survey in Flin Flon.

Manitoba recognizes that programs such as the Flin Flin/Creighton Green Project are improving the soils and natural ecosystems in the Flin Flon area. Government support to this program will be continued and enhanced.

Additional samples will be collected and analyzed to fill data gaps or address incomplete information.

### **Who should you contact for more information?**

Please contact Manitoba Government Inquiry at 1-866-626-4862 or go to the Manitoba Conservation website at: [http://www.gov.mb.ca/conservation/wildlife/managing/mon\\_eco.html](http://www.gov.mb.ca/conservation/wildlife/managing/mon_eco.html)