



Acres International Limited
500 Portage Avenue, 6th Floor
Winnipeg, Manitoba, Canada • R3C 3Y8
Tel: 204-786-8751 • Fax: 204-786-2242
www.acres.com

October 29, 2003
P13808.03

Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU
X0E 1J0

Attention: Ms. Dionne Filiatrault, P.Eng.
Senior Technical Advisor

Dear Dionne:

**Nanisivik Mine
Comments on Underground Mine
Solid Waste Disposal Plan**

As per your memorandum dated October 10, 2003, Nunavut Water Board (NWB) requested Acres International Limited (Acres) to review a document prepared by Canzinc, titled "Nanisivik Mine – Waste Disposal Plan". The document was prepared as a requirement under Item G 16 of the NWB1NAN0208 current water license, and submitted on August 1, 2003.

Background

Item G 16 of the license refers specifically to the underground mine solid waste disposal plan. NWB also require Canzinc to submit other documents for the water license, including:

- Waste Rock Disposal Plan (Item G 8).
- West Twin Disposal Area Closure Plan (Item G 15).
- Landfill Closure Plan (Item G 17).

Canzinc submitted a Waste Rock Disposal Plan for 2002 in February 2002. It is understood that progressive reclamation work had been carried out until the end of the mine operation in September 2002, and perhaps continued after September 2002. However, the most current waste rock disposal plan is not included as part of the document for this review. Canzinc indicated that it will be submitted as a separate report under item G 8 of the license.

Estimated volumes of contaminated soils are not included in the Waste Disposal Plan document, as Canzinc indicated that these volumes will be determined through the confirmatory samplings from the Phase III environmental assessment report. The Soil Quality Remediation Objective (SQRO) information is also not available at this time.

We reviewed the Waste Disposal Plan document and provide the following comments.

General Comments

In the absence of the most current waste rock disposal plan, the volumes of contaminated soils, and the details on the proposed destinations for the waste rock and soils, the document is not complete and requires further updating. Section 8 of the document (Available Storage Space) would need some improvements, as the two accompanying maps do not include a summary on the details related to each of the disposal areas.

It is understood that the Waste Rock Disposal Plan will be submitted as a separate document. However, a summary containing volume quantities and destinations of each of the waste rock piles/areas must be included in this document. A complete material balance table should be prepared to show the quantity and type of waste materials that will be stored underground, and how much space is available.

Item G 16 of the license requires identification and allocation of available space, and how this space will be filled based on the risk and the depth of the underground workings. Placement methods and schedules for the disposal should be included as part of the disposal plan.

There are discrepancies with regard to the title of the document. The cover letter provided by Canzinc indicates the document title is "Nanisivik Mine's Underground Mine Solid Waste Disposal Plan". However, the main title of the document is "Nanisivik Mine – Waste Disposal Plan". The subsequent pages of the document contain a header "Nanisivik Mine – Detailed Waste Disposal Plan".

Section 3 Storage Locations

A general site map showing each of the storage locations would be useful. Estimate quantities or percentage of waste materials to be disposed, for each of these locations, should also be included.

Section 4 Flow Chart

- (a) The chart should also provide direction for cases where soil contains both metal and hydrocarbon.
- (b) Abandoned equipment that is designated as AE2 (can be stored directly) should contain arrows which lead both to the "crush or cut up" box and to "burn wood debris and deposit other in selected storage site" box. It should have the same option as the demolition debris (DD1) or as AE1 after its contaminant is removed.
- (c) For AE1, some contaminant may be removed by washing. The contaminated liquid from washing, although it is not categorized as solid waste, should be indicated in the flow chart for proper disposal. Where will the washed water be disposed?
- (d) The flow chart should also indicate where the waste materials will be disposed to (underground, buried under the industrial complex, etc.), i.e. any specific destinations for each type of the waste materials.

Section 5 Documentation

It is not clear when this documentation will be prepared and completed. The examples indicated that it would be prepared prior to the actual disposal activities, as it contains information on the action required for each of the items. Will it be part of an updated version of this document?

Section 6 Disposal Plan

- (a) Some of the items indicated in this section are not finalized, as there is still potential to remove structures off-site (i.e. sold to third parties). Do the estimated volumes shown reflect such potential? As an example, the tank farms and their related structures. The tank farm consists of 18 tanks of various sizes. There is potential to sell some or all of these tanks to a third party. The space designated for this item (100 m³) appears to be relatively small. Is this the quantity for a small percentage of the tanks, which are assumed not sold?
- (b) Summary tables are incomplete, as no volumes of contaminated soils are provided. Tentative and conservative volumes should be assigned for the analysis, until the data becomes available.

Other Areas Not Included in Section 6

- Landfarm
No information is provided on the existing landfarm materials located near the landfill site. The Closure and Reclamation Plan indicated that some of this material would go underground, but no further detail was provided in this document.
- Other structures/areas outside the industrial complex, warehouse area, dock area and town site.
The above structures/areas, which include ANFO facilities, storage shipping containers (various sites), end user tanks and areas (various sites), disturbed borrow areas, etc. are not included in the document.

Section 8 Available Storage Space

The two maps attached in the document do not provide a clear picture of available spaces for underground storage.

- Maps do not show scale.
- The map's legend is confusing, and does not specifically show underground or above-ground storage.
- Clarification is required between waste disposal, solid waste disposal, and waste dump. How do the above descriptions match with the classification table that is shown in Section 3?
- The quantities shown on the map do not add up to 435,000 m³ nor 315,000 m³.
- No explanation is provided, whether the shown quantities represent "void space" or actual space that is required for disposal (i.e. reflecting the 60-75% space utilization).
- The document indicates that the capacity for disposal of waste materials far exceeds the estimated space required. However, as no information is available on the current volumes of waste rock and contaminated soils for disposal, the balance between the waste materials

which require disposal and the available space is not clear. A summary table that shows details of the waste materials (such as type, estimated quantity and destination for disposal) and the space available for disposal (location, estimated space available) would help to clarify the disposal plan.

As a suggestion, it may be useful and practical if the waste rock disposal plan and the underground solid waste disposal plan be consolidated into one comprehensive report, which covers all waste materials for the Nanisivik Mine's closure and reclamation purposes. Canzinc's document title (Waste Disposal Plan) appears to have led in this direction. The plan should incorporate all of the waste rock, soil contaminants, abandoned equipments, and demolition debris, and cover both the underground disposal plan, as well as above ground disposal in the open pits and in foundations of the industrial complex areas. Issues which are related to domestic refuse/landfill site and mine tailings will remain to be covered under separate documents: The Landfill Closure Plan and the West Twin Lake Disposal Area Closure Plan, respectively.

I hope that the above comments are suitable for your purpose. If you have any further questions, please contact us.

Yours very truly,

A handwritten signature in black ink, appearing to read 'R.A. Halim', with a long horizontal stroke extending to the right.

R.A. Halim, P.Eng.
Senior Geotechnical Engineer

RAH:sep

R:\P\1380000\1380803_Nanisivik2\Letters\UG storage_Oct_2003.doc