March 21, 2003
P13808.03

Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU
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Attention: Ms. Dionne Filiatrault, P.Eng.,
Senior Technical Advisor

Dear Dionne:

Nanisivik Mine - Reviews of Phase II Environmental Site Assessment (ESA) Report, Emergency Response Plan (ERP) Report, and Human Health and Ecological Risk Assessment (HHERA) Report

As per your request , Acres has undertaken preliminary reviews of the following documents:

< Phase II Environmental Site Assessment (ESA) for the Nanisivik Mine, as prepared by Gartner Lee Limited for Canzinco Ltd. and issued on January 30, 2003. The Phase II ESA report was submitted as per Section G, Item 13 of the Water License NWB1NAN0208.

< Emergency Response Plan (ERP) prepared by Nanisivik Mine/Canzinco Ltd. and issued on February 28, 2003. The ERP report was submitted as per Section E, Item 1 of the Water License NWB1NAN0208.

< Human Health and Ecological Risk Assessment (HHERA), as prepared by Jacques Whitford Environment Limited For Canzinco Ltd., and issued on January 30, 2003. The HHERA report was submitted as per Section G, Item 14 of the Water License NWB1NAN0208.

The first two reports were reviewed internally by Acres. A list of items that need to be discussed and clarified during the proposed technical meeting to be held in Iqaluit on March 28, 2003 are described hereafter. The third report (HHERA) was reviewed by Dillon Consulting Limited (Dillon) of Cambridge, Ontario on behalf of Acres. Unfortunately, the report by Dillon is not currently available for your review. We will keep inform on the status of Dillon's review report on HHERA. They have indicated to us that the review report will be available on March 25, 2003. We will fax a copy of the report to you as soon as it becomes available.

1. Issues Related to the Phase II ESA Report

1.1 Report Format

Overall, the Phase II ESA report addresses most of the issues in a format which is similar to the one recommended by the Canadian Standards Association (CSA Z769-00 Standard for Phase II ESA). However, there are several items which may need to be brought to attention:

< Chapter 6 of the report identifies the contaminants and areas of environmental concern. This culminates the conclusion of the report, based on the site assessment and evaluation of the field investigations. However, the report must also include a summary for other contaminants and/or issues such as marine sediments, air quality/dust monitoring, surface water quality and acid rock drainage. These topics are discussed and summarized in Chapter 3, but they are excluded in the final conclusion of the report or in the Executive Summary.

< The report provides some referenced documents which are relevant to the studies (such as foot-noted references shown in Page 6). However, not all of the referenced materials are documented. A full list of references and supporting documents should be included in the report.

1.2 Sampling Method

For the field investigation program, there are various methods which can be employed for determining the sampling program. One of the methods utilizes random sampling through a grid system, another method is to collect samples based on preselect locations, or based on prescreening of potential or historical occurrence of contaminations (such as known areas of spills, heavy traffic, or intense activities, etc). In some cases, both methods are utilized to provide the best possible coverage of the area, and to obtain representative samples.

In general, the field investigation program which was performed for the Phase II ESA at Nanisivik Mine appears to follow the preselect sampling program using judgmental approach rather than a systematic grid system. Because of the large area of the mine site to be covered, this approach may be the most realistic one. However, how much confidence does the assessor have on this sampling method, and are there any areas which may have been inadvertently missed, or may require further investigations?

1.3 Issues in Phase I ESA and Interim Phase II ESA Reports

One component of a Phase II ESA study is to review the existing Phase I ESA report, as well as other background information. The Phase I ESA and the interim Phase II ESA reports, which were prepared by Nanisivik Mine, describe clearly the main issues and concerns related to the landfill and the landfarm.

Section 3.5 of the report (pp. 33 to 35) discusses the possible contaminants and potential areas of concern, which form the basis for and the direction of the Phase II ESA studies. However, the landfill and landfarm were excluded in this section of the report. Have the assessor at this point considered that the issues and concerns described in the Phase I ESA and interim Phase II ESA did not warrant further investigation?

One of the specific issues which were described in the Phase I ESA and interim Phase II ESA was the concern over the drums of waste oil and glycol buried in the landfill. The Phase II ESA report did not discuss or mention about this issue. Has the sampling and testing of soil and

groundwater in the area, performed as part of the Phase II ESA studies confirmed that there is no concern associated with this issue? Such assessment, evaluation and conclusion must be included in the report. Are there any additional investigations required, such as geophysical survey for buried steel structures/drums as recommended and presented by EBA and Government of Nunavut in their presentation for the public hearing in July 2002? Will installation of additional monitoring wells and a monitoring program be required to specifically follow up to this issue?

Either way, it is critical that the Phase II ESA provides a closure to the questions and concerns addressed by previous reports, including Phase I ESA, and concerns brought up during the public hearings in July 2002.

1.4 Phase II ESA and Nanisivik Mine's Closure and Reclamation Plan

The CSA Standard describes the requirements, recommended practices, and various phases of the studies for an environmental site assessment. Phase I ESA is a non intrusive study, intended to identify actual and potential site contaminations via record reviews, site visits and interviews. In contrast, Phase II ESA is an intrusive undertaking, involving sampling, drilling and testing to further determine, confirm or discard the issues identified in the Phase I study. Phase II study may be repeated or expanded as necessary to solve or answer all of the concerns. Phase III ESA is generally undertaken to develop remedies for contaminated sites. Such steps may be included as part of the Closure and Reclamation plan. Between the Phase II and Phase III of the ESA, a human health risk and ecological risk assessments could be required to determine acceptable risk for any specific site.

The Phase II ESA report does not appear to summarize or indicate whether additional investigations are required, or whether the studies are complete and all of the issues have been satisfactorily addressed. It does not provide comments for any future activities or actions which may be required to ensure that environmental concerns are taken care of for the remediation phase of the work. As an example, there are no discussions about the facts that the field investigations were limited by the presence of existing buildings and structures, at which locations samples could not be economically collected. However, this shortcoming does not mean that these areas are excluded from the concerns of the potential contamination. A discussion or statement must be made in the report addressing these potential concerns, such as dealing with potentially contaminated soils under the existing tank farms, buildings, etc.

1.5 2000 Marine Sediment Studies

CCME provides sediment quality guidelines for evaluation of potential contamination concerns in the marine environment. The discussion, review and evaluation of the field tests and previous reports, including the 2000 study by Dr. Bo Elberling were presented in Section 3.1. It was indicated that elevated metal concentrations were encountered on some sediment samples taken in Strathcona Sound during the 2000 study (pp 23-24). However, the Phase II ESA does not provide an evaluation of these test results, as well as other previous studies, using the CCME guidelines for marine sediment samples. The results and findings of this section of the report are not carried forward to the conclusion part of the report. It is not clear what is the relevance of these test results, and whether there should be any environmental concern.

1.6 QA/QC of Chemical Analysis

Some selected samples were chemically tested for zinc (Zn) and lead (Pb) by both an independent laboratory testing (Accutest Laboratories Limited, Ottawa, Ontario), and by on-site laboratory at the Nanisivik Mine. Table 12 shows both results of the tests, with details included in Appendices E and F.

Are Accutest and on-site laboratory testing methods and procedures the same? What is the significance of "AAS", attached in the description for the zinc, lead and iron concentrations for the on-site laboratory test results?

Table E (p. 45) shows the number of chemical tests which were carried out by on-site laboratory, and by Accutest to determine metal concentrations in the soil and water samples (101 tests for metal by on-site laboratory, and 131 tests by Accutest). Table 12 shows that the test results on similar samples prepared by the two laboratories differ by up to 70 times. As shown in this table, Accutest test results are in some cases higher than the on-site laboratory test results (2 out of 16 tests for zinc, and 6 out of 16 tests for lead). Based on these discrepancies between the two test results, how much confidence does the assessor has in the test results presented in the report? How do these variations affect the evaluation of the test results against the values used in the CCME Guidelines? Do the test results which were reported in Tables 2 to 11 come only from Accutest, or from both on-site and Accutest laboratories?

1.7 Surface Water Quality

Taking into account the presence of natural outcrops of massive sulphides in the area, and the earlier studies of the surface water which have been completed since 1974, the following items need to be addressed:

- What values of metal concentrations in the surface water would be acceptable after the cessation of the mining activities?

- What values are considered as baseline readings for each metal concentration?

- Will the baseline readings be used as target values for the long term metal concentrations in the surface water for the area? How will these target readings be achieved in the short term (during reclamation period) and in the long term?

A summary of observations based on the surface water quality at Nanisivik Mine at the Twin Lakes Creek as discussed in Section 3.3 should also be presented in the conclusion of the report. Comments must also be included in relation to the Kuhulu Lake and Chris Creek, whether the assessor believes that these two bodies of water are or are not areas of environmental concern.

1.8 Air Quality Monitoring

Summary of observations which were presented in Section 3.2.4 (pp. 26 and 27) is not presented in the conclusion of the report. On the basis of the test results, are there any concerns of the air quality at Nanisivik Mine? Will additional monitoring be required, expanded, or reduced as a result of the observations?

What were the reasons behind the selection of data collection method (i.e. TRP vs. TSP) for the three sampling locations?

1.9 Diesel Contamination Behind the Carpenter Shop

Figure 5 shows that the locations of all samples (6 test pits and 1 surface sample) collected in the Carpenter shop area are from the north side of the building. Where did the 2000 spill occur? Was the spill area located to the west of the building? The above ground tank is located behind the carpenter shop (west side of the building). Why were there no sampling carried out to confirm that the area surrounding the remediated area is now free from contamination concerns?

1.10 Bone Yard Area, Northeast of Industrial Complex

The report indicates that the bone yard area was not used at the time of the site investigation (p. 51). Only one sample (Sample SS 02-29, shown in Figure 3) was collected. The chemical analysis of sample SS02-29 as shown in Table 4 indicates concentrations of zinc and lead exceeding the CCME Guidelines. What is the historical use of this yard, and is additional sampling and testing required to confirm the test results? Are there any other potential contaminants which may be present in this abandoned yard?

1.11 High Lead Concentration in STOL Area

A soil sample which was collected in the STOL area and tested for metal concentration yielded a relatively high lead concentration (Section 5.3.6, page 69). The lead concentration (9350 mg/kg, Table 7) is the highest encountered during the field investigation and sampling program of the Phase II ESA. This value is approximately 35 times greater than the value established by CCME guideline for commercial land setting.

In view of the above test result, and given that only a single sample was collected and tested for metal concentration for the entire STOL area, is further sampling and testing warranted?

1.12 Other Potential Contaminants in the Warehouse Yard and the Material Storage at the Dock

These two sites have been used to store a variety of chemicals and fuel/oil supplies, from methyl isobutyl carbinol, lime, copper sulphates, to various types of lubricating oils. Nanisivik's Warehouse and Material Storage Plans show the locations where all of these chemicals/supplies are stored in these two sites. Fourteen test pits were excavated in the material storage area at the dock, but only 4 test pits were excavated in the warehouse yard across from the industrial/mill site. Have any screening been carried out during the Phase II ESA field investigation to ensure that there are no potential contamination of these chemicals which may spread into the surrounding area? Did testing of soil and groundwater samples adequately address the potential contamination from these chemicals? Did the four test pits excavated in the warehouse yard adequately address the contaminant concerns for the entire yard?

1.13 Table D on Page 47

It is assumed that this is a typographical error, and is it supposed to be Table E?

2. Issues Related to the ERP Report

2.1 Current Information in the ERP Report

The ERP report should contain the most current information possible, particularly on contact personnel and their phone numbers in case of an emergency. We would like to confirm that the following information has been updated to reflect the current conditions of the Nanisivik Mine, which ceased operation at the end of September 2002.

< Section 2 Reporting Procedures
Has this section been revised to reflect the current staff at the Nanisivik Mine? How many staff personnel are still living at the mine site? Are there enough staff personnel to cover the various duties described in the response team organization, such as on-scene coordinator, communications officer, health and safety officer, operations coordinator, etc?

< Section 6 Response Equipment and Resources
Have Tables 6.1 and 6.2 been revised to reflect the current inventory of the mine?

< Section 7 Training and Exercising
Can it be confirmed that the names of personnel who are listed in Table 7-1 are still working and living at the mine?

< Appendix A
PCB Storage Contact Information and Authorized Entry List. Some of the personnel listed in this appendix have no longer lived or worked at the mine. A revised information is required for the report.

2.2 Tailings Spill Containment

A small concrete dyke is shown in Figure 3-1, and discussed in Section 3, Page 1 and in Section 5, Page 1. It is assumed that this dyke is intended to contain spills from the tailings system, and to prevent the tailings materials to enter into the Twin Lakes Creek. When was this structure built? What is the size and dimensions, and the foundation of the structure? Is the reservoir (containment area) lined and what capacity does the containment area behind the dyke has?

2.3 Marine Spill (Section 13)

The three spill scenarios described in this section deal with petroleum hydrocarbon spill and contamination. Are there other potential marine spills which need to be addressed in this section, such as potential spills from deliveries of chemical supplies, etc at the dock? What typical materials, other than fuel, are expected to be delivered at the dock after the mine closure in October 2002?

2.4 Fuel Tank Decommissioning (Section 14)

This is an emergency response plan document, and a step by step decommissioning procedure (such as soil sampling, backfilling, and disposal of materials) for the dismantling of fuel storage tanks is not required. However, some paragraphs describing emergency actions during dismantling of the fuel tanks are relevant and should be included in this report.

2.5 Missing Figure

Figure 2-1 is not included in the list of Figures, but it was discussed in Section 2 (Reporting Schedules) of the report as Spill Response Management Structure.

We hope that the above information is adequate for your purpose. Should you have any further questions about this review report, please contact me.

Yours very truly

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