

CULLATON LAKE GOLD MINES LTD.

WATER LICENCE NWB1CUL0207

**APPLICATION TO AMEND APPROVED
ABANDONMENT AND RESTORATION PLAN
TO ENCAPSULATE WASTE ROCK
AT THE SHEAR LAKE PORTAL**

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ATTACHMENTS

**Assessment of Closure Options and Impacts, Shear Lake Zone Waste Rock,
Cullaton Lake Mine, Nunavut – URS Norecol Dames & Moore – February 2003**

1.0 INTRODUCTION

Homestake Canada Inc. (HCI) holds Water Licence No. NWB1CUL0207 for the Cullaton Lake Gold Mine located in the Nunavut Territory. Part F, Clause 5 of the license states:

“The Licensee shall submit to the Board an application for amendment to the approved Abandonment and Restoration Plan by January 1, 2003 for the new waste rock disposal area on the shores of Shear Lake. This application shall include but not be limited to the following:

- a. Discussion of the waste rock disposal method that was implemented and a review of other alternatives;*
- b. Assessment of impacts of the waste rock disposal method;*
- c. Identification of mitigation measures;*
- d. Monitoring requirements (i.e. short/long term monitoring water quality, temperature, etc.); and*
- e. Implementation schedule for undertaking(s) and submission of final plan.”*

HCI requested an extension to the January 1, 2003 submission date on November 21, 2002. An extension to February 14, 2003 was approved by the Nunavut Water Board on December 4, 2002.

The report constitutes an application for amendment to the approved Abandonment and Restoration plan for the Cullaton Lake Gold Mine to include encapsulation of potentially acid generating waste rock at the Shear Lake Portal Site. Encapsulation will limit oxygen and water interaction with the waste rock and thus significantly reduce the potential for acid generation. This document provides a summary of the information requested by Part F, Clause 5 of the license. Supporting documentation is contained in:

“ Assessment of Closure Options and Impacts, Shear Lake Zone Waste Rock – Cullaton Lake Mine, Nunavut – URS Norecol Dames & Moore Inc. – January 2003”

2.0 BACKGROUND

The Cullaton Lake Gold Mine was partially developed in 1975 by O'Brien Gold Mines, with the development of a 110 m decline. However, for economic reasons the project was put on hold. In 1980 plans were developed to extend the decline and drill to confirm previous metallurgical test work. Based on the results of this test work a decision was made to develop the mine. The Cullaton Lake mine was in operation for four years, from 1981 to 1985, under Water Licence N6L2-0940. Two ore zones were mined during this time, first the B-Zone and then in 1984,

the Shear-Zone. The mine closed in August 1985. Between September 1985 and summer 1991 the mine was held in a care and maintenance mode.

International Corona Corporation (property owner since 1985) began decommissioning the mine in 1991/92. Activities included the rehabilitation of the Tailings Pond #1 dam including construction of a spillway in the dam, covering of the exposed tailings with water or with till/mine rock, and the elimination of Tailings Pond #2 (the polishing pond). The fresh water intake, pump house and pipelines at the old diamond drill camp on the Kognak River were dismantled and removed in 1991.

HCI acquired the property in 1993 as the result of an amalgamation with International Corona Corporation. After a review of the site in 1994, Homestake continued with the reclamation of the property. An Abandonment and Restoration Plan was developed in 1995 and submitted to Department of Indian Affairs and Northern Development (DIAND) and the Northwest Territories (NWT) Water Board in 1996.

Over the period of 1996 to 2001, rehabilitation of the site was continued in accordance with the approved Abandonment and Restoration Plan, including several amendments during that period.

During site visit and planning process in 2000, HCI staff noticed dead vegetation around the toe of the Shear Lake Waste Rock area. Samples of the rock were collected and analyzed in the fall of 2000. It was determined that the rock was generating acid from sulphides contained in the rock.

The HCI initial plan for the mitigation of the waste rock was to place it underwater in Shear Lake. Applications for approval were made to the Nunavut Water Board and the Department of Fisheries and Oceans in 2001. Subsequent follow up included a site visit by DFO staff and the development and submission of a Fisheries Habitat Compensation Plan.

During the 2001 reclamation activities, a survey of the waste rock pile was conducted. A trench was dug into the material using a tracked hoe. It was discovered that the waste rock was a thin layer (up to 30 cm. deep) on top of approximately 1 meter of finer material that acted as a base for the stockpile. The estimate of waste rock was reduced to approximately 1000 cubic meters based on this thickness and the stockpile area. The finer material was estimated at 10,000 to 15,000 cubic meters. Due to the reduced volume a decision was made to encapsulate the material on site. Encapsulation was chosen to limit oxygen and water access to the waste rock and thus significantly reduce or eliminate acid generation.

The area selected for encapsulation was in the general vicinity of the Shear Lake Portal and located down slope from the lake such that any drainage from the material would be away from Shear Lake. Local till previously used for building pads and roads was used to encapsulate the waste rock. First, a compacted till layer approximately 1 meter thick was laid down forming a pad. The waste rock was then placed on this pad and covered with approximately 1 meter of fine till and then 1 meter of coarser till. The area was then seeded with a local grass seed mix. As well, a toe berm was constructed around the encapsulated waste rock to collect any drainage.

This was reported to the Nunavut Water Board in October 2001 in a report summarizing the years reclamation activities. In 2002, HCI submitted a combined annual report for the water license and an application to renew the licence which was due to expire in October, 2002. This report included an application for approval for the encapsulation of the waste rock.

3.0 WASTE ROCK RECLAMATION ALTERNATIVES

HCI engaged URS Norecol Dames & Moore Inc. (URS) to review the encapsulation of the waste rock and alternate disposal methods. This review is included in the attached report.

3.1 Reclamation Alternatives

URS reviewed 5 potential reclamation alternatives for the Shear Lake waste rock. The criteria used for the review were that alternatives must prevent acid rock drainage and metal leaching and must be suitable for a remote site, accessible only by air.

The five alternatives are:

1. Place in Tailings Impoundment No. 1 and submerge;
2. Blend with B-Zone Waste Rock, to provide neutralization capacity;
3. Collect and treat surface runoff and dump seepage;
4. Subaqueous disposal of waste rock in Shear Lake; and
5. Consolidate waste rock and cap with local till (encapsulation).

After a review of the five alternatives, URS concluded that encapsulation was the most appropriate method for the Shear Lake waste rock disposal. The primary consideration for this selection was the ability of encapsulation to limit infiltration of water and thus limit oxygen and water contact with the acid generating material.

As the Cullaton Lake Mine is located in an area of continuous permafrost, a secondary consideration is that encapsulation may result in raising the permafrost into the pile.

3.2 Potential Impacts of Selected Disposal Method

The potential impact from the chosen waste disposal method, encapsulation, would be seepage from the waste rock. Seepage could potentially contain low pH and metals which, with overland flow, could enter Shear Lake Creek. However, this is considered to be an unlikely situation for the following reasons:

1. A cover of 2 meters will reduce or eliminate infiltration of meteoric water into the stockpile. If infiltration is eliminated, there is no source of water for seepage from the pile.
2. The toe berm constructed around the pile would collect any seepage from the pile and prevent overland flow. There was no sign of seepage from the pile or collected in the toe berm during the 2002 site inspection.
3. The pile is located such that any flow will be directed away from Shear Lake.
4. Low precipitation and low temperatures at the site are expected to limit infiltration into the pile and thus minimize seepage.

In the unlikely event that seepage should occur from the encapsulated waste rock, mitigation measures will likely consist of passive treatment.

3.3 Proposed Monitoring Programs

The Nunavut Water Board licence for the project, NWB1CUL0207, requires HCI to establish two new Surveillance Network monitoring points for the Shear Lake waste rock disposal area, as follows;

1. 940-25 Area of seepage from Waste Rock Disposal area to Shear Lake
2. 940-26 Thermistors installed in waste Rock Disposal area

These stations will be established during the site inspection in 2003, currently planned for July.

As discussed earlier, the waste rock encapsulation has been situated so that any seepage would be directed away from Shear Lake. Therefore, Station 940-25 will be located to sample any seepage detected from the pile on its downstream side. No seepage was detected during the 2002 site inspection.

As discussed in Section 3.1, encapsulation was chosen to limit oxygen and water contact with the waste rock, not to raise the permafrost level in the waste

rock pile. Any freezing would be a benefit but not the primary ARD reduction mechanism. However, HCI will install Thermistors in the pile in 2003 to determine if the permafrost level is entering the pile.

HCI proposes to monitor the water quality and temperatures in 2003 and 2004. If the results of this monitoring indicate no seepage from the waste pile and no impacts, HCI will apply for approval to discontinue monitoring on the site.

3.4 Implementation Schedule

The Waste Rock encapsulation was completed in 2001. As discussed in the attached report by URS, this is considered to be the best available option for the site to eliminate potential water quality issues.

The Thermistors will be installed in the summer of 2003, probably in July. Water samples will also be taken at that time.

Monitoring will continue in 2004 and, if no seepage is seen at this time, consideration will be given to discontinuing monitoring, as there will have been no seepage since construction in 2001.

4.0 SUMMARY

In 2000, during a routine site inspection, HCI determined that the waste rock pile adjacent to the Shear Lake portal area was impacting the local vegetation, probably due to ARD generation.

During the reclamation program in 2001, HCI encapsulated the Waste Rock by placing it on a pad constructed from local till and then covering it with 2 meters of till.

HCI engaged URS to review the encapsulation and compare this to other potential closure options. URS's review is contained within the attached report. The review confirms that encapsulation is the best method for reclamation of this waste rock and prevention of ARD in the future.

This report, as well as the attachment by URS, constitutes the HCI application for an amendment to the approved Abandonment and Restoration Plan for Cullaton Lake to include encapsulation of the waste rock near Shear Lake.