**Before the Nunavut Water Board**
**In the matter of:**

**an Application by**
**TeckCominco Ltd.**
**for the renewal of**
**Water Licence**
**N4L2-0262 / NWB1POL**
**(Polaris Mine)**

# Written Intervention

**By**

**Department of Indian Affairs**
**and Northern Development**

**February 28, 2003**

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# Introduction

This intervention to the Nunavut Water Board (NWB) is made on behalf of the Department of Indian Affairs and Northern Development (DIAND) with respect to the Application by TeckCominco Ltd. (the Licensee) for the renewal of Water Licence N4L2-0262. The Application seeks a renewal for the purposes of the decommissioning and reclamation of the Polaris Mine.

# Background

Water licence N4L2-0262 was issued to TeckCominco Ltd. (then known as Cominco Ltd.) on January 1, 1994, for industrial water use and waste disposal relating to mining and milling at the Polaris Mine, a zinc-lead mine situated on Little Cornwallis Island, Nunavut. It was the third water licence issued to the company since the mine began its operations in 1981.

The mining and milling operation at Polaris Mine has recently ended, and the Licensee has begun its abandonment and reclamation activities. These activities are detailed in the *Polaris Mine Decommissioning and Reclamation Plan* (D&R Plan), which was submitted to the NWB in March 2001. After requesting comments from various stakeholders and a thorough review, the NWB partially approved the D&R Plan on April 15, 2002. The sections of the D&R Plan that were not approved included Garrow Lake and the Garrow Lake Dam, the Frustration Lake jetty, as well as the marine dock and the adjacent shorelines; all areas that also required a Fisheries Authorization before work could proceed.

With water licence N4L2-0262 expiring on December 31, 2002, the Licensee applied for a water licence renewal on October 4, 2002. The application was forwarded to the Nunavut Planning Commission (NPC), and then to the Nunavut Impact Review Board (NIRB). NIRB issued their screening report on December 5, 2002, stating that the application process may continue without review under Part 5 or 6 of Article 12 of the *Nunavut Land Claims Agreement*. The NWB extended water licence N4L2-0262 for an additional 60 days to allow time for the licencing process to take place so that the Licensee would not be without a water licence during that period. A pre-hearing conference was held on January 9, 2003, during which the scope for this public hearing was determined.

Per the scope determined from the pre-hearing, this intervention will focus on the issues of:

1) conditions applying to water use,
2) conditions applying to waste disposal,
3) conditions applying to closure and decommissioning activities (focusing on the components that were not previously approved by the NWB),
4) conditions applying to the surveillance and monitoring program,
5) conditions applying to financial assurances to be provided by the Licensee, and
6) recommended term of the licence.

# 1. Conditions Applying to Water Use

Polaris Mine currently obtains its water from Frustration Lake, which is situated approximately 5 km to the north and slightly to the east of the airstrip and main buildings. The intake system consists of an 88 m long jetty, a pump house, and a 200 mm pipeline that connects the pump house to the storage tank near the airstrip. These facilities and related pipelines will be dismantled per the approved portion of the D&R plan. Comments relating to the proposed dismantling of the jetty will be provided below.

With the mining and milling activities terminated, water consumption for domestic and reclamation activities is expected to be approximately 250,000 $m^3$ in the year 2003, and 200,000 $m^3$ in the year 2004. After 2004, the reclamation work is expected to be completed and there will no longer be any water requirements.

DIAND recommends that clauses be included in the water licence to identify the water supply source and the volume limits for all purposes. In this case the source is Frustration Lake, and the annual volume should not exceed 250,000 $m^3$/year. Further, a monitoring station should be placed at the water intake to monitor the volume of water used.

# 2. Conditions Applying to Waste Disposal

Sewage and grey water is collected by gravity through a pipeline to a sewage holding tank located near the processing barge. The sewage is macerated by grinder pumps, then discharged to the submerged ocean outfall. These facilities will be dismantled and disposed of per the approved portion of the D&R Plan.

Polaris Mine has several solid waste landfills. In 2000, the construction landfill was moved and consolidated to the base of the operational landfill. The operational landfill contains construction materials, wood scraps, empty drums, and municipal-type solid waste such as food waste. The solid waste at the operational landfill was periodically burned, compacted, graded and covered. Thermistors installed in 1999 confirmed that the landfill remained frozen even throughout the warmer summer months. The landfill should be covered and contoured per the approved portion of the D&R Plan.

A reclamation landfill was initiated in 1997 in the subsidence area above the ore body. This landfill was used to bury obsolete heavy equipment and other materials such as tires, steel, vehicles, and miscellaneous steel or wood items. This landfill should be covered and its inventory photo-documented per the approved portion of the D&R Plan.

The Little Red Dog Quarry will also be used as a disposal area for material from the demolition of buildings and concrete foundations. Bulky items will be cut into smaller pieces to minimize voids within the landfill. This landfill should be compacted, covered, and contoured as per the approved

portion of the D&R Plan. Some of the bulky items and scrap metal will also be disposed of in the underground workings. These items should also be disposed of and photo-documented per the approved portion of the D&R Plan.

All hazardous materials should be removed off site, per the approved portion of the D&R Plan. Likewise, waste oil should be incinerated so that none remain on site, per the approved portion of the D&R Plan.

DIAND recommends that clauses be included in the water licence to indicate that any solid waste generated by the construction camps after the landfills have been covered and closed should be burned, if applicable, and that the remaining non-combustible materials should be removed off site to be disposed of in an approved area. Likewise, sewage generated by the construction crew after the sewage facilities have been dismantled should be temporarily stored and either disposed of in an approved manner, or removed off site to be disposed of in a proper sewage disposal facility.

# 3. Conditions Applying to Closure and Decommissioning Activities

DIAND recommends that the clauses in the water licence indicate that the Licensee must follow the approved portion of the D&R Plan with respect to closure and decommissioning activities. Because the D&R Plan only received a partial approval, this section of DIAND's intervention includes comments on the sections of the Plan that still require approval. Our comments focus on the Garrow Lake and dam, the Frustration Lake jetty, and the marine dock and shoreline area. A brief background is given for each area, along with DIAND's recommendations.

### 3.1 Garrow Lake and Garrow Lake Dam

Tailings have been deposited in Garrow Lake since the start of milling operations at the mine site. Garrow Lake is a meromictic lake, which means that the water is stratified into layers that differ chemically from one another. The upper layer contains oxygenated brackish water with a limited aquatic population. The bottom layer has a high salinity, is anoxic (devoid of oxygen) and has no aquatic life. In between the two layers is a thin mixed layer; it is the transition zone where the salinity increases and the oxygen decreases from the concentrations of the upper layer to the concentrations of the lower layer.

The tailings have been deposited in the lower layer of Garrow Lake, where the anoxic conditions prevent the occurrence of acid rock drainage and metal leaching. This therefore keeps the tailings inert and harmless to the environment.

In 1989, breaks in the pipeline resulted in the zinc (Zn) concentrations in the upper layer of the lake to increase. To prevent its release into the environment, a dam was created at the lake's outflow. With the pipes repaired, the concentration of Zn has slowly decreased over the years. The dam, however, allowed the water level of Garrow Lake to rise approximately 3 m above it's normal level.

The most recent reclamation plan for Garrow Lake was submitted as part of the *Polaris Fish Habitat Restoration Plan* dated May 24, 2002. With the closure of the mine, the current proposal by TeckCominco is to draw down the additional 3 m of water to bring the lake back to its pre-dam levels and then remove the dam. Approval for siphoning the water was granted by the NWB on February 4, 2000.

With respect to the options of either leaving the dam in place, creating a spillway, or removing the dam, DIAND agrees that leaving the dam in place in perpetuity is not a valid option. The best long-term option is the removal of the dam as it removes the need for long-term maintenance.

The Licensee has provided reports and models indicating that the draw-down of Garrow Lake is unlikely to create instability and cause the layers of the lake to mix, and thus expose the tailings to oxygen and allow the metal concentrations to rise in the upper layer. Although DIAND tends to agree with these models, there is still a slight chance of an unexpected problem causing instability and a mixing of the layers. DIAND therefore recommends that Garrow Lake be closely monitored for several years after the draw-down to confirm that the models were indeed accurate.

Overall, DIAND is satisfied with the proposed decommissioning plan, mitigative actions, and contingency plans provided in the *Polaris Fish Habitat Restoration Plan*.

### 3.2 Frustration Lake Jetty

Frustration Lake is the water source for Polaris Mine. Located at Frustration Lake is an 88 m long jetty and pump house. The jetty is composed of gravel and finer materials. Rip rap was also placed to protect the jetty from erosion. The jetty has apparently been in operation for 22 years without any signs of erosion.

Options for the reclamation of the jetty area at Frustration Lake were provided in a letter dated October 15, 2002, by Gartner Lee Limited. The options presented were the removal of the jetty, leaving the jetty in place, and partial removal of the jetty. The conclusion indicated that removing the jetty would have an immediate environmental impact during the removal. On the other hand, leaving the jetty in place would be the best option as it would have no immediate environmental impact and provide fish habitat in the long term. DIAND concurs with this conclusion.

DIAND therefore recommends that the pump house, pipes, and other loose surface materials be removed from the jetty, but that the jetty itself remain in place.

### 3.3. Marine Dock and Adjacent Shorelines

The most recent proposed plans for the marine dock and adjacent shorelines reclamation appear in the *Polaris Fish Habitat Restoration Plan*. In summary, the Licensee plans on removing the dock and all obstacles (such as sheet piles) to at least 3 m below low sea level and on regrading the shoreline in a way to prevent erosion by wave and tide action.

DIAND is satisfied with the proposed decommissioning plan, mitigative measures and contingencies provided in the *Polaris Fish Habitat Restoration Plan*. However, since this deals with the marine foreshore, this aspect of the reclamation is technically outside the scope of a freshwater water licence. DIAND suggests that approval of the dock decommissioning by Fisheries and Oceans Canada by means of a Fisheries Authorization should be sufficient to approve this aspect of the D&R Plan.

## 4. Conditions Applying to Surveillance and Monitoring

The Licensee's suggested post-closure monitoring plan is described in two time periods: Phase I (reclamation period) and Phase II (post-reclamation).

The reclamation period refers to the time when reclamation work will be underway and is anticipated to be during the years 2003 and 2004. Because the Licensee will still have manpower at the site, the monitoring and reporting will remain frequent, as required by the water licence.

The post-reclamation period refers to the period following the completion of active reclamation work. This monitoring will be carried out from 2005 until 2011. Since continuous manpower presence at the mine site is not planned during the closure period, monitoring will be carried out during site visits.

Overall, DIAND is satisfied with the proposed monitoring plan. However, as previously mentioned, the draw-down on Garrow Lake and removal of the dam does cause some uncertainties. DIAND recommends that the frequency of the Phase II monitoring of the stability of Garrow Lake (at SNP station 262-3) be increased. The sampling is of a vertical profile of the lake, and includes sampling for pH, temperature, conductivity, total lead (Pb) and total Zn. As currently proposed, the Licensee would take monitoring samples annually in 2005, 2006, 2008, and 2011, and, as a contingency, take additional samples in 2007, 2009, and 2010. DIAND suggests that this frequency be increased to at least once annually from 2005 through 2011. The contingency monitoring if unexpected results are recorded should also be increased to three times per year (mid-winter, maximum ice thickness, and maximum ice melt, as during Phase I).

## 5. Conditions Applying to Financial Assurances

Section 76 of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* authorizes the NWB to require a licensee to furnish and maintain security with the Minister in accordance with the regulations, or in a manner satisfactory to the Minister. In addition to the Act and regulations, DIAND's Mine Reclamation Policy for Nunavut provides further guidance on the need for a licensed mining company to provide the Crown with financial security adequate to ensure that the site is reclaimed at the expense of the mining company. DIAND's position on mine site reclamation is that mining companies must have financial securities in place so that costs for the mine site clean-

up do not become the responsibility of the Crown. With respect to older mining operations dating prior to the policy, such as Polaris Mine, a case-by-case assessment must be made.

The Licensee has provided a cost estimate for the decommissioning of the Polaris Mine at a value of $47.5 million in its letter to the NWB dated November 26, 2002. Out of this amount, the company has already expended $10.4 million, resulting in $37.1 million of work remaining to be completed. Since the remaining reclamation work of $37.1 million has been tendered, DIAND is satisfied that the estimate provided is indeed an accurate third-party estimate of the liability that remains at Polaris Mine.

DIAND acknowledges that it is difficult to separate water-related components of the site, or of the reclamation activities, from land-related components, and that any apportionment of D&R costs as water-related components and land-related components will not be exact. Nevertheless, DIAND submits that the NWB must do its best to identify those costs which may reasonably be allocated to water-related components. DIAND believes that $2.9 million of the liability value - notably the mine equipment removal, the fuel storage and handling equipment removal, the dock and shoreline area, the dismantling of the ship loader and conveyor, miscellaneous demolition and clean-up, the dismantling of the CRF plant structure, the dismantling of the accommodation and other buildings, and the land lease rental and property taxes - is clearly only land-related. That leaves a value of $34.2 million of reclamation work that can be apportioned to the water-related components of the site.

We would like to note that DIAND is confident that the Licensee will perform the reclamation work required; a confidence earned by the company's excellent and pro-active environmental work during the course of its operations. As a transparent application of our Mine Reclamation Policy, however, we must request for security equal to the full current liability of the mine site. DIAND therefore recommends that the water licence require a security of $34.2 million.

Finally, clauses should be included in the renewed licence for an annual review of the current estimate of liability. The amount of security required could then be adjusted accordingly.

## 6. Term of the Licence

The proponent proposes that post-closure monitoring take place until December 2011. With reclamation work expected to end in 2004, that would leave 7 years of post-closure monitoring. The 2011 termination of monitoring is also expected to coincide with the termination of the company's land lease of the Polaris Mine site.

DIAND recommends that the renewed water licence be issued for a period of 9 years, until the end of December 2011.

It should be noted that if issues are identified during the period of monitoring, the Licensee should undertake corrective actions. At a minimum, the Licensee should proceed with the contingency

actions described in the approved portion of the D&R Plan. Such issues may result in the Licensee being forced to remain on site beyond 2011 to properly address the situation.

## Conclusion

The proponent has provided a D&R plan that has been thoroughly vetted and revised since the circulation of the first draft in May 2000. Overall, DIAND is satisfied with the plan as presented, including the recent modifications provided in the *Polaris Fish Habitat Restoration Plan*. The only recommendation we have regarding the plan is to increase the frequency of monitoring of Garrow Lake during Phase II of the reclamation.

DIAND recommends that the Licensee receive a 9 year term of licence, with an expiry of December 2011. Throughout the term of the licence, the Licensee should maintain security equal to the amount of liability that remains at the mine site. DIAND believes that the amount is currently $34.2 million. This amount should be reviewed and adjusted annually to reflect the changes in liability at the site.