



**Environmental  
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Project No. 1039597

May 30, 2008

Mr. Robert Carreau  
Vice President, CSR and Sustainability  
Breakwater Resources Ltd.  
Suite 2000  
95 Wellington Street West  
Toronto, ON  
M5J 2N7

Dear Mr. Carreau:

**Re: RECOMMENDED WATER QUALITY MONITORING FOR CLOSURE PERIOD - NANISIVIK MINE**

As per your request, Jacques Whitford has reviewed the plan prepared by Gartner Lee Limited, namely *Nanisivik Mine Reclamation and Closure Monitoring Plan* dated February 2004. Jacques Whitford also reviewed the water quality data collected from 1996 to 2007, inclusive.

The Monitoring Plan (February 2004) was designed to provide information related to two fundamental objectives:

1. Identification of the immediate needs for site management and the provision of diligent environmental protection activities; and
2. Assessment of the overall performance of reclamation measures.

The Plan was developed in the context of two time periods: the Reclamation Period; and the Closure Period.

- The Reclamation Period encompassed the period of active physical reclamation of the mine site and the completion of the major activities in the Mine Closure Plan.
- The Closure Period immediately followed the Reclamation Period, and was designed for an estimated duration of 5 years.

A review of the Plan was deemed appropriate as the project now advances from the Reclamation Period to the Closure Period. This milestone has triggered an evaluation of to evaluate the then “forward looking” monitoring program designed in 2004 and to determine whether any adjustments were appropriate to meet the committed objectives. The following presents a summary of our findings and recommendations.

Figure 1 presents the existing water sampling locations at the Nanisivik Mine. For the purposes of evaluating the water quality data, sampling locations were



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grouped as presented in Table 1. It should be noted that the sampling locations reviewed include several stations not required under the License but which are monitored regularly by the proponent.

**Table 1 Sample Location Groupings**

Station Grouping	Station
Twin Lakes Creek Watershed	NML-23, 159-4, 159-9, 200-7, 159-11, 200-3, 159-10, and 159-6
Chris Creek Watershed	159-15, 159-16, 159-14, 159-13, and 159-17
East Adit Treatment Facility	159-12B, 159-12, 159-12A
Landfill Watershed	NML-26, NML-30, NML-29, TP02-95, TP02-97, TP02-102, and TP03-387

The monitoring program has included analysis of various general chemistry parameters and trace metals along with the biological testing requirements of the MMER program. For the purposes of this review only the chemical parameters have been evaluated. Jacques Whitford undertook the Environmental Effects Monitoring (EEM) program under MMER on behalf of the proponent. The results of this monitoring program were reported in the document "*Metal Mining Environmental Effects Monitoring, Nanisivik Mine, Nunavut*" (EEM), dated July 25, 2006. The EEM program was approved by Environment Canada and the mine, which is now formally closed, has no further responsibilities under MMER.

In the way of general comment, concentrations of most parameters near the Twin Lakes watershed, East Adit Treatment Facility, and Landfill watershed show a decreasing trend over the past several years, which is consistent with the process of decommissioning the mine. The only area where this is not clear at this time is in the Chris Creek watershed. However confounding factors at this location include the removal of the temporary retention ponds which were in place during mine operation, and which diverted some water from mineralized areas from Chris Creek. The increasing trends for some parameters in Chris Creek likely represent a return to pre-mining conditions (BCR 1974)<sup>1</sup> with the products of natural weathering processes in these mineralized areas once again reporting to Chris Creek.

Based on a review of the data, Jacques Whitford recommends the Water Quality Monitoring Schedule presented below in Table 2. The Table presents a summary of the recommended parameters to be sampled and the frequencies of sampling during the Closure Period for (*i.e.*, for 2008 through 2010).

<sup>1</sup> BC Research 1975 – Terrestrial Environmental Studies at Strathcona Sound

**Table 2 Water Quality Monitoring Schedule - Closure Period Years 3 to 5 (2008 to 2010)**

	Station	Description	Field Parameters	Laboratory Parameters
Twin Lakes Creek Watershed	NML-23	Outflow - East Twin Lake	2W	2W - T, S, TSS
	159-4	Outflow - West Twin Disposal Area	2W	2W - T, S, TSS
	159-9	Twin Lakes Creek stream crossing	2W	2W - T, S, TSS
	159-10	Twin Lakes Creek upstream of west townsite tributary	2W	2W - T, S, TSS
	159-6	Outlet of Twin Lakes Creek into Strathcona Sound	2W	2W - T, S, TSS
Chris Creek	159-15	Chris Creek upstream of Area14	2W	2W - T, S, TSS
	159-14	Chris Creek downstream of k-Baseline	2W	2W - T, S, TSS
	159-17	Outlet of Chris Creek into Strathcona Sound	2W	2W - T, S, TSS
Landfill Watershed	NML-29	Downgradient of Landfill - east drainage system (intermittent surface flow)	2W	2W - T, S, TSS

**NOTES:**

1. 2W = every 2 weeks, M = monthly.
2. Field Parameters include: pH, conductivity, and temperature.
3. All metals analyses to comprise hardness, cadmium, lead, and zinc. T = Total Metals, S=Sulphate, TSS = Total Suspended Solids.
4. TSS determinations may be conducted at the on-site laboratory; other determinations to be made at an accredited off-site laboratory.

The sampling locations presented in Table 2 have been strategically identified as either background sampling locations or in the immediate area and/or downgradient of former mine activities. Further it is expected that these locations along with the suggested frequencies and parameters, will provide the required information to ensure the reclamation objectives are being met.

This report has been prepared for the sole benefit of Breakwater Resources Ltd. The report may not be used by any other person or entity, other than for its intended purposes, without the consent of Breakwater Resources Ltd and Jacques Whitford Limited.

The information and conclusions contained in this report are based upon work undertaken in accordance with generally accepted engineering and scientific practices current at the time the work was performed. The information provided in this report was compiled from existing documents, design information provided by Breakwater Resources Ltd., data provided by regulatory agencies and others. Information obtained from secondary sources has been assumed to be correct; Jacques Whitford accepts no responsibility for damages or liability that may arise from use of this data.

If any conditions become apparent that deviate from our understanding of conditions as presented in this report, Jacques Whitford requests that we be notified immediately, and permitted to reassess the conclusions provided herein.

This report was prepared by Shereen Ismail, P.Eng., and was reviewed by Malcolm Stephenson, Ph.D. If you have any questions or comments on the contents of this report, please contact the undersigned.



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We trust that the above information fulfills your needs at this time. Should you require additional information, please do not hesitate to contact us.

Sincerely,

**JACQUES WHITFORD LIMITED**

*(Original Signed By)*

Shereen Ismail, P.Eng.  
Project Engineer

SI/MS/jll

Attachment

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