Appendix E

Executive Summaries

English and Inuktitut

Community Summary

The Nanisivik Mine is located on northern Baffin Island. It is an underground zinc-lead mine which is owned by CanZinco Ltd. and has been in continuous operation since 1976. The Nanisivik Mine stopped producing zinc and lead concentrates in September 2002 and is now permanently closed. An important part of mine closure will be ensuring that the site is returned to a condition that protects the health and safety of Nunavut residents and permits the continued use of the land by local residents. The Hamlet of Arctic Bay will play an important part in the mine closure plan. CanZinco Ltd. is committed to ensuring that this occurs through the distribution of a Mine Closure Plan that will be reviewed by all stakeholders and ultimately approved by the Nunavut Water Board, DIAND and the Government of Nunavut.

All of the proposed mine reclamation work is described in this report. A short summary of the proposed work is listed below

1. All underground equipment and machinery will be either shipped from the Nanisivik site for use elsewhere or disposed of in the underground mine. The continuous permafrost in the underground mine will provide a secure location for obsolete equipment. All mine entrances will be permanently sealed.
2. CanZinco has collected extensive information about the effects of the mine on the environment and will continue this information collection process into the future. So far, this information has identified some specific areas on the mine site where the soil is contaminated with metal and/or hydrocarbon (that is, diesel fuel). CanZinco has proposed to put this soil back into the underground mine where the permafrost will ensure that the soil will remain in isolation from the surrounding environment for all time.
3. The tailings generated from the milling operation at Nanisivik have been placed in a containment area at West Twin Lake. There are two tailings deposition areas. One area contains tailings that are underwater and the other area contains tailings that are above water. Water sampling by CanZinco has shown that water meets the water quality criteria set by the Nunavut Water Board.
4. The tailings that are now underwater will be kept underwater and tailings that are now above water will be covered with over 4 feet (1.25 m) of shale plus a gravel cap that will ensure permafrost formation in the tailings and the base of the cover. Extra shale will be included to protect the tailings from global warming.
5. The dock at Strathcona Sound is owned by the Department of Fisheries and Oceans (DFO). The Federal Government may choose not to remove the dock and to continue to use it as a refueling depot. The fuel tanks could also be a beneficial addition to this kind of operation but this has not yet been decided.
6. The roads connecting the airport, dock, Arctic Bay and Nanisivik to East Twin Lake are owned by the Government of Nunavut and are not part of Nanisivik's closure plan. The future use of the airport and the roads is not under the company's control.
7. There are many ideas for using Nanisivik and some other mine buildings after the mine closes. So far, these ideas have not been made into a plan that has been agreed to by the Government of Nunavut and others. Therefore, CanZinco is required by law to tear down the entire town and mine buildings except those that are owned by the Government of Nunavut. This will start in 2004.
8. Machinery, tools and other useful items at the mine will be removed.

CanZinco will monitor the Nanisivik site for 7 years to ensure there are no long term environmental problems. CanZinco will also keep talking to the Hamlet of Arctic Bay during this monitoring period. At the end of 7 years, the information will be closely examined and the need for continued monitoring will be decided. CanZinco expects that the mine site will be seen to be in a good condition and that the Surface Lease can be returned to the Government.

CanZinco will work with the Hamlet of Arctic Bay and the Government of Nunavut to find jobs for local residents to help with the reclamation work. Some residents have experience working at the mine site and might be able to help as soon as the work begins, if they wish. There might be opportunities for a few

people to take training at the site and the company will try to help these people, working in cooperation with the Hamlet and the Government of Nunavut.

Levi Barnabas is hired by the GN to be a liaison officer. This means that Levi can help people to talk to the GN and to the company about jobs, training or bidding on mine items for sale.

Executive Summary

The Nanisivik Mine is owned by CanZinco Ltd., a division of Breakwater Resources Ltd. Both CanZinco and its parent company, Breakwater, own and operate mines elsewhere in Canada and around the world. CanZinco has owned the Nanisivik mine since 1996.

The mine site is located in the Canadian Arctic on northern Baffin Island. The mine site lies on the south shore of Strathcona Sound at approximately 73 degrees north latitude. The environment around the mine site is typical of the arctic region and is characterized by cold temperatures, low precipitation, continuous permafrost and largely barren surface soils, which render the mine area poor for vegetation coverage and wildlife use.

The Inuit Hamlet of Arctic Bay, population 700, is located approximately 25 kilometres by road west of Nanisivik. Access to the mine site and to Arctic Bay is via scheduled jet air service from Iqaluit. Freight is delivered to Nanisivik via ship during the 14-week open water season.

Nanisivik commenced operations in 1976 and operated continuously to September 2002, at which time the mine was permanently closed due to the depletion of economic ore reserves. Sulphide ore was mined primarily by underground methods and milled on-site to produce lead and zinc concentrates. The mill operated at a nominal 2,200 tonnes per day. Mine personnel resided in the town of Nanisivik, which was constructed as part of the mine facilities. The town facilities include a school, church, post office, recreation center, dining hall, houses and apartments. The mine employed 171 people when operating and, since closure, has employed a skeleton crew of 4 to 8 people to preserve the assets and conduct environmental monitoring work required by the Water Licence.

The development of the mine was partially funded by the Government of the Northwest Territories (as it then was) and some of the town facilities and infrastructure are currently owned by the Government of Nunavut ("GN"). These facilities include the church, town water supply, sewage treatment system, housing, the road from the dock to the airport and to Arctic Bay as well as other infrastructure. Reclamation of these GN-owned facilities is the responsibility of the GN.

The dock is owned by the Department of Fisheries and Oceans. Reclamation or continued use of the dock is the responsibility of the Federal Government

The GN and the Hamlet of Arctic Bay have publicly expressed a strong interest in identifying and implementing plans for the continued use of the town of Nanisivik and some of the industrial buildings. To this end, the GN initiated two projects: to identify the possible socio-economic impacts of the mine closure on the Hamlet of Arctic Bay and to identify and evaluate alternatives for continued use of the Nanisivik mine facilities. CanZinco shares this interest in identifying alternatives for continued use and has contributed to these projects and is currently conducting negotiations with the GN for the possible transfer of ownership of some mine owned facilities. Nonetheless, CanZinco must proceed with reclamation of the mine facilities in a cost-effective manner as described in the Reclamation and Closure Plan and will continue to do so until formal agreements are in place to the contrary.

CanZinco is pleased to confirm that the Industrial Complex has been sold to another mining company, Woldfen Resources Inc. Wolfden intends to remove the facility from the Nanisivik mine site to its High Lake property in the Kitikmeot Region. This sale provides benefit to the Nanisivik site and to Nunavut by keeping a useful facility in service for the continued benefit of northerners. The liability for reclamation of the facility and any contaminated soils continues to reside with CanZinco, as the mine owner and licencee.

This report, *Nanisivik Mine 2004 Reclamation and Closure Plan*, is the culmination of an extensive sequence of environmental studies, technical reviews, technical meetings and report approvals that started with the submission, in February 2002, of the initial mine closure plan. Since that time, CanZinco has completed and received the Nunavut water Board's approval for an *Environmental Site Assessment* program conducted by Gartner Lee Limited and a *Human Health and Ecological Risk Assessment* developed by Jacques Whitford Environment Ltd

This report, accompanied by its attendant appendices, provides detailed technical descriptions of all of the proposed reclamation activities and fulfills the specific requirements of the Water Licence in this regard. The Board should be able to use the information presented here to conduct a technical review of the proposed plans and to satisfy itself that the plans are appropriate and will accomplish the reclamation objectives. Ultimately, CanZinco requests the Board's approval of the plans so that they may be carried out in a timely and efficient manner

CanZinco's approach to reclamation and closure of the Nanisivik site is to conduct the work in an efficient manner that follows the *Mine Site Reclamation Policy for Nunavut (2002)* and that promotes benefits to northern residents. The primary objectives of the proposed reclamation and closure work are in accordance with the Policy's objective to "ensure the impact of mining on the environment and human health and safety is minimized".

The reclamation work is focused on utilizing the natural conditions to provide for the secure, long-term closure of the mine site. Reactive mine wastes, such as tailings and mineralized waste rock, will be reclaimed by incorporating them into the permafrost regime either in the underground mine or beneath a cover of inert material. The same approach will be undertaken at the landfill facility. The freezing conditions will prevent contamination of surface water. The required thickness of inert cover to ensure permafrost formation has been calculated to include the estimated effects of climate warming.

The reclamation activities are anticipated to be completed in two years, 2004 and 2005. Options exist to potentially shorten this schedule and these will be pursued, where practical. A series of stand alone detailed design documents have been developed, which are appendices to this report, that describe the specific details of the closure designs for each of the mine facilities such as the tailings disposal area and the landfill facility. Some of the key reclamation measures that are proposed for 2004 and 2005 are:

- Place a thermal insulation cover of shale (1.0 m) and a durable cap of sand gravel (0.25 m) over exposed tailings to ensure that the tailings remain frozen and isolated from the environment even under a worst-case prediction of climate warming.

2. Provide a minimum 1 m water cover over subaqueous tailings to prevent oxidation of tailings from affecting water quality.
3. Construct an engineered outflow spillway from the covered tailings area designed to provide environmental protection against an extreme flood (probable maxim flood).
4. Relocate mineralized waste rock to the underground mine or to open pits where backfilling is required.
5. Contour and backfill open pits and place a thermal insulation cover that is thicker than proposed for the tailings cap (1.95 m shale plus 0.25 m sand and gravel) to ensure that the waste rock and mineralized wall rocks remain frozen and isolated from the environment even under a worst-case prediction of climate warming.
6. Place a thermal insulation cover of shale (1.95 m) and a durable cap of sand gravel (0.25 m) over the landfill facility, in addition to the shale that is already in place from mining operations, to ensure that the tailings remain frozen and isolated from the environment even under a worst-case prediction of climate warming.
7. Dismantle industrial and residential buildings and salvage components of economic value for shipment off site or for sale locally.
8. Dispose of non-hazardous demolition debris and residual scrap materials in the underground mine or in open pits where backfilling is required.
9. Remediate contaminated soils by covering in-place or by excavation and disposal in either the underground mine or in open pits that require backfilling.
10. Install additional monitoring instruments to monitor ground temperature and depth of thaw in reclaimed areas.
11. Conduct environmental monitoring of the site to confirm long term stability and success of the reclamation measures.

Monitoring of the mine site is scheduled for a period of 7 years (a 2-year period of active reclamation work plus a 5-year post reclamation period) from 2004 to 2010. This will include water quality, ground temperatures, general reclamation inspections and geotechnical inspections. The results of the monitoring programs will be reported to the Nunavut Water Board quarterly and annually and any maintenance work that may be required will be completed. At the end of the 7-year period, the effectiveness of the reclamation work will be closely evaluated through a *Comprehensive Performance Review*, for which the terms of reference are required by the Nunavut Water Board in March 2007. At that time, a determination will be made regarding the need for continued monitoring or return of the property to the government.

1.1 G.4 - Reclamation Cover Design

1.1.1 Executive Summary

Under the terms of Water Licence NWB1NAN0208 issued by the Nunavut Water Board (NWB), CanZinco Ltd., the current owner of the Nanisivik Mine is responsible for continuation of on-site environmental protection activities and developing for submission and approval of a Final Reclamation and Closure Plan ("RCP").

The Nanisivik Mine 2004 RCP has been developed, as per the terms of the Water Licence as a series of stand-alone documents, each addressing in detail the information and proposed closure measures for one specific component or topic area. This document and the information presented herein are provided in response to the requirements for report Part G, Item 4, the Reclamation Cover Designs.

In accordance with Part G, Item 4, of the Water Licence, this report provides the following requirements for the Cover Design:

1. A description of the proposed materials.
2. The results of field-testing and thermal modelling for covers over tailings, waste rock and landfill debris.
3. Plans showing the pre- and post-cover topography using sufficiently detailed contour intervals.
4. An assessment of cover performance under 1 in 100 year return period (warm year) and global warming scenarios.
5. Confirmation of availability of materials for cover construction.
6. The bathymetry of sub-aqueous tailings in West Twin Lake Reservoir which shows the extent of tailings located within 1.0 m of the water surface, and plans for mitigation of wave action on these tailings.
7. Quality Assurance/Quality Control measures for short and long term maintenance.
8. A verification of cover thickness against extreme annual temperature variation (i.e., 1:100 year warm event) verified within the boundaries already provided by global warming estimates.
9. An evaluation of alternatives for increasing minimum water depth in the Reservoir with emphasis on possible effects of waves and winter ice cover on long term water quality.
10. An assessment of cover thickness with reference to cover result available for Area 14 as a case study.

In summary, this Cover Design Report provides details for the following components:

- Review of cover design options for various materials including tailings, waste rock, open pits and the landfill.
- The rationale for selecting the recommended cover materials and thicknesses.
- A detailed cover grading plan along with material quantities for the Surface Cell and Test Cell areas.
- A monitoring plan to assess the performance of the cover during closure.
- A series of contingency plans that may be implemented should the cover perform in an unacceptable manner.

The conceptual review of cover design considers the requirements of covers for potentially acid generating mine wastes and for landfills. In cold regions, the purpose of the cover is to allow permafrost to develop within the waste and to restrict the depth of thawing to within the cover thickness. A frozen, ice saturated zone develops within the cover that will limit infiltration of water and air into the underlying waste materials. This provides a reduction in oxygen diffusion and prevents the generation of leachate and movement of contaminants. Since the purpose of the cover is to provide a thermal barrier to maintain frozen ground conditions, granular materials, such as sand and gravel and crushed rock can be used. These materials are abundant at Nanisivik.

The site is located within the continuous permafrost zone, with a Mean Annual Air Temperature (MAAT) of –15.1° C. The long-term temperature trends from several weather stations in the vicinity of Nanisivik were used to estimate the 1:100 year warm annual temperature for Nanisivik of –13.3° C. Climate change due to global warming is expected to increase the MAAT at Nanisivik by 2.8° C by 2100 for the "Best Estimate" case and 5.0° C for the "High sensitivity" case, as provided by Environment Canada.

Various cover types were reviewed, including wet cover and dry cover options. Dry cover options included geosynthetics and natural materials. Natural materials on site include marine silty clay, Airport sand, till, Twin Lakes sand and gravel and shale. A dry cover option using shale was selected as the main component of the cover for the following reasons:

- Availability: shale is available in sufficient quantities at locations proximal to the areas requiring covering.
- Workability: shale has been used for various purposes throughout the life of the mine and the site staff have a valuable knowledge base of quarrying and handling the material.
- Carbonate content: may provide buffering capacity should acidic leachate be produced by the underlying tailings.
- Grain size characteristics the quarried grain size characteristics of the shale do not require additional mechanical breakdown to be used as cover material.

The Twin Lakes sand and gravel was selected as an armouring material to be placed above the shale to limit erosion from both wind and water. This material was selected as the armouring material based on the following factors:

- Durability: the material is composed of re-crystallized quartzite, which is characteristically highly durable and resistant to weathering.
- Availability: the material is available in sufficient quantity in an area proximal to the West Twin Disposal Area
- Light colour: the light colour of the material (tan to reddish) will reflect sunlight and provide less heat absorption than darker materials.

The report provides details of the geotechnical properties of the preferred cover materials, which included grain size distribution, compacted density, natural and saturated moisture content, durability and permeability. Samples of shale were tested to assess the acid generation and acid consumption potentials. As expected, the acid-base accounting analyses confirmed the general expectation that the shale is acid consuming. A humidity cell test was conducted for 37 weeks, which indicated that leachate remained neutral (pH > 7.5) throughout the test.

The design of the covers was based on an assessment of the ongoing Test Cell cover study, geothermal modelling and thermal assessment of the Area 14 waste rock cover. The Test Cell covers have been studied by CanZinco since 1989. Five test covers were constructed using various tailings materials and varying degrees of compaction and saturation with thicknesses of about 2 m. Monitoring of the depth of annual thaw in the covers indicated that the maximum depth of thaw decreased each year to a range of 0.73 m to 1.4 m. This trend indicated that the permafrost was developing within the base of the covers. In addition, examination of the covers in test pits indicated that a zone of ice had developed within the base of the cover due to seasonal infiltration and freezing of water. This ice saturated zone will form an effective barrier to the diffusion of oxygen and water between the tailings and the rest of the cover.

Geothermal modelling of the cover was carried out to evaluate the potential variations in the depth of the active layer thaw within the shale cover due to extreme temperature events. The thermal model was calibrated to the site test cover data and then extended for extreme warm years and for global warming scenarios over the next century. Based on this assessment, the design cover system for the tailings is comprised of 1.0 m of quarried shale fill, covered by 0.25 m of Twin Lakes sand and gravel. This proposed thickness appears adequate to resist both the 1 in 100 year warm event and the High Sensitivity estimate of global warming over the next 100 years.

Assessment of the Area 14 rock cover was done to compare the cover requirements for the tailings, which is saturated and waste rock, which is unsaturated. Since the underlying waste is not saturated, water that percolates through the cover may drain through the waste rock and not form an ice zone barrier whereupon the depth of the active zone will be greater than in the tailings covers. An additional thickness of cover is required to ensure freezing of the waste. Based on the actual field trial in Area 14 and results of thermal modelling, the total cover thickness was determined to be 2.2 m of shale or 1.95 m of shale and 0.25 m of Twin Lakes Sand and Gravel

Regrading of the tailings surface will be done before any shale is placed. The proposed Surface Cell cover results in the placement of approximately 400,000 m^3 of shale and 95,000 m^3 of Twin Lakes sand and

gravel. The proposed Test Cell cover requires approximately 151,000 m^3 of shale and 27,500 m^3 of Twin Lakes sand and gravel.

Material specifications, construction considerations, fill placement and quality control/quality assurance procedures are detailed for the shale and Twin Lakes sand and gravel cover materials. During construction, detailed information will be collected concerning cover thickness, grades and elevations, level of compaction, grain size analysis and moisture content. Upon completion of construction, performance monitoring will include collection of ground temperature, piezometric pressures and water quality information, as well as observing the physical condition of the covers. A monitoring schedule for the Reclamation and Closure Period (7 years) has been provided.

Several contingency plans have been developed that address potential performance issues, such as erosion of the armouring layer or underlying shale, deformation of the cover, excessive depth of thaw and poor quality of surface water runoff. The consequences of each issue and suggested mitigative approach are summarized in table format. Common to all suggested mitigation measures is identification of the root cause and appropriate reaction to limit environmental consequences of each concern.

1.2 G.5 - West Twin Disposal Area Talik Investigation

1.2.1 Executive Summary

Under the terms of Water Licence NWB1NAN0208 issued by the Nunavut Water Board (NWB), CanZinco Ltd., the current owner of the Nanisivik Mine, is responsible for continuation of on-site environmental protection activities and developing for submission and approval of a Final Reclamation and Closure Plan ("RCP").

The Nanisivik Mine 2004 RCP has been developed, as per the terms of the Water Licence as a series of stand-alone documents, each addressing in detail the information and proposed closure measures for one specific component or topic area. This document and the information presented herein are provided in response to the requirements for component report Part G Item 5, the West Twin Disposal Area Talik Assessment.

In accordance with Part G, Item 5 of the Water Licence, this report provides the following requirements for the Talik Assessment:

The Licencee shall submit to the Board for approval a report assessing the postulated Talik in the surface tailings cell and the test cell, which shall include but not be limited to

1. *The results of drilling and other investigations to characterize the extent of the Talik;*
2. *Thermal conditions and soil properties within the Talik;*
3. *Identification of the potential for and extent of frost heave, pore water expulsion (volume, rate and water quality) and Pingo formation, and measures to mitigate the effects of any of these processes should they be expected to occur; and*
4. *Water sampling requirements in conjunction with a water quality predictive model*

In summary, the talik assessment report should provide for the following:

- Characterize the talik in the Surface Cell and Test Cell in terms of physical extent and geothermal conditions:
- Provide a basis for performance monitoring during closure; and
- Develop contingency plans should observed performance deviate from anticipated performance.

Nanisivik is located in the region of continuous permafrost. Permafrost has been observed to extend to a depth of at least 430 m, as observed in a borehole drilled from the underground workings. Ground

conditions in the area have been characterized as having the potential for medium amounts of ground ice (as high as 20%) and mean annual ground temperatures colder than -10°C.

The West Twin Disposal Area is comprised of an upper, solids retention pond, the Surface Cell, and a lower, water retention pond, the Reservoir. An earthen dike, the West Twin Dike, separates the Surface Cell and the Reservoir. The Reservoir is further divided by the Test Cell Dike, which separates the Reservoir and the Test Cell. Both dikes are constructed of frozen shale fill and are founded on frozen, settled tailings.

The first shale lift of the West Twin Dike was built in 1991. The dike has been raised in an upstream manner where each new lift begins on top of beached tailings material deposited previously and a sealing lift of frozen shale rockfill. The dike was raised every year between 1991 and 1999, except 1994.

The Test Cell Dike is also constructed of frozen shale fill overlying frozen tailings. The dike was constructed in two stages. The first stage increased the height of the Test Cell Dike to an approximate elevation of 383.5 m. The second stage increased the height of the Test Cell Dike to an approximate elevation of 385.5 m. The second stage of the dike is partially founded on the first stage dike and partially founded on the tailings in the Test Cell.

The development of the taliks within the tailings is closely associated with their depositional history. Tailings were initially deposited sub-aqueously into the bottom of West Twin Lake beginning in 1977. By 1988, the capacity of West Twin Lake to store tailings was exhausted and approval was received from the NWT Water Board to begin surface deposition of tailings. To accommodate this, West Twin Lake was divided into two sections by the West Twin Dike. The eastern portion of the lake, the Reservoir, remained at the original lake level. The western portion of the lake, the Surface Cell became the main deposition area for the tailings. The tailings in the Surface Cell, were deposited sub-aerially, commencing in 1990. The excess water from the tailings were collected in a depression upstream of the south end of the dike, then siphoned into the Reservoir. The ultimate raise of the dike to elevation 388 m was completed in 1999. Tailings continued to be placed into the Surface Cell until the mine closed in September 2002. In total, it is estimated that 6.5 million m^3 of tailings were deposited into the Surface cell between 1978 and 2002.

In the Reservoir and Test Cell area, tailings deposition into West Twin Lake began in 1976. The discharge of tailings took place along the centreline of the West Twin Dike from the north end of the dike resulting in tailings spreading in a south-easterly direction into the Reservoir. Tailings were also placed along an east-west trending line from the centre of the West Twin Dike. By 1988 a tailings causeway was exposed in the Reservoir, which became the foundation for the east-west arm of the Test Cell Dike. Additional tailings deposition along a northwest-southeast trending line resulted in exposure of a second tailings causeway, which became the foundation for the north/south arm of the Test Cell Dike. The Test Cell Dike was constructed in 2000-2001, increasing the tailings storage capacity of the Test Cell. Tailings were also deposited along the toe of West Twin dike, resulting in aerial exposure of tailings in the Reservoir. In total, it is estimated that 3.5 million m^3 of tailings have been deposited into the Reservoir and Test Cell since 1978.

Once the tailings became exposed above the level of West Twin Lake, the material was no longer protected from freezing. A complex freezeback process evolved in the Surface Cell as a result of the continuous placement of tailings and the presence of the water-filled depression. The tailings under the water continued in a thawed state, resulting in a vertical continuation of the original talik under West Twin Lake. Tailings that were placed sub-aerially were subjected to permafrost aggradation, primarily from the surface downwards and towards the margins of the surface pond.

A staged geotechnical investigation was conducted in 2002 and 2003 to gain a better understanding of the physical characteristics of the West Twin Disposal Area tailings deposits. A total of 44 boreholes were drilled in the Surface Cell, Test Cell Area and Dike and at the toe of the West Twin Dike. The investigations included installation of instrumentation to measure ground temperatures. If thawed ground conditions were encountered, monitoring wells and piezometers were installed to assess water quality and water pressures. Various samples collected from the boreholes were selected for laboratory testing. Tests

included grain size, moisture content, bulk density, frozen bulk density, specific gravity and thermal conductivity. Tests were conducted on tailings and lake bed sediments. Bedrock core samples were tested for point load strength index.

The results of the geotechnical investigation programs, indicates that taliks exist within the tailings in the Surface Cell and Test Cell. This information, along with the historical tailings deposition practices in the West Twin Disposal Area, were reviewed and interpreted in order to characterize the geotechnical and geothermal properties as well as the extent and magnitude of the taliks. No permafrost aggradation is anticipated into the Reservoir tailings due to the water cover.

One of the significant findings of the investigations was the presence of thawed tailings at temperatures below 0°C. Analysis of the water samples collected within the thawed zones indicated the presence of soluble salts, with an estimated concentration of 4 parts per thousand (ppt). This resulted in a freezing point depression of about 0.2° C. Instrumentation installed in the Surface Cell indicates freezing pint depression values potentially as low as -1.2°C.

Within the Surface Cell, the estimated limits of the talik were based on drilling data and temperature measurements. It is estimated that the Surface Cell contains about 2,000,000 m^3 of thawed tailings. Additionally, some 1,000,000 m^3 of thawed tailings are located in the Test Cell Area. Using a volumetric water content of 40%, the total volume of pore fluid that may be expelled upon freezing within the Surface Cell and Test Cell tailings was estimated to be 104,000 m^3. This volume has been assumed within the water balance done for the contaminant loading of the West Twin Disposal Area.

Geothermal modelling of the Surface Cell talik was carried out to predict the rate of permafrost aggradation into the talik. Analyses were also conducted to assess the variability and sensitivity of the results to initial thermal conditions, global warming, snow cover and the placement of shale as a cover material. The freeze-back temperature was assumed to be –0.2° C. Analyses were done to estimate the time required for the talik to freeze back to several key elevations within the Surface Cell:

- Elevation 371 m - the approximate base elevation of the West Twin Dike. The model predicted a time period ranging between 7 to 8 years after the initial winter, depending on the modelled scenario.
- Elevation 365 m - the approximate base elevation of the tailings base beneath the West Twin Dike. Depending on the modelled scenario, the estimated time for permafrost aggradation ranged from 13 to 15 years after the initial winter.
- Elevation 353 m – the approximate elevation of the deepest part of the tailings. The estimated time for permafrost aggradation was between 27 and 32 years after the initial winter, depending on the modelled scenario.

The geotechnical implications of permafrost aggradation into the taliks are the potential for frost heave, pore water expulsion and pingo formation. A review was undertaken of the various mechanisms associated with these issues in order to identify the potential effects and measures required to mitigate these processes, should they occur. Following a review of the information, the following determinations were made:

- Frost heave of the surface is likely.
- Cryoconcentration within the talik is likely
- Hydrofracturing that reports to the surface is unlikely.
- Pingo formation is unlikely.
- Formation of a cryopeg, an isolated zone of saline permafrost, is likely within the Surface Cell talik.
- Pre fluid from the Surface Cell cryopeg may possibly migrate towards the Reservoir area, under the frozen extent of the West Twin Dike.

A performance monitoring program was developed to provide a means of assessing the freezeback of the taliks and potential impacts that may occur. The monitoring requirements are fully detailed in the

Monitoring Report (Water Licence requirement Part G, Item 9). The monitoring program provides for freezeback monitoring during the 2-year Reclamation Period and for a subsequent 5-year Closure Period. Monitoring will involve visual inspections, surveys, installation of new instrumentation and measurement of ground temperatures, water pressures and water quality.

Several contingency plans have been developed in order to address performance issues that may be identified during the reclamation and post-closure monitoring periods. These issues may include slower than anticipated freezeback of the taliks, elevated pore pressures in the taliks, poor Reservoir water quality, formation of pingos or frost mounds and dike instability. The consequences of each issue and suggested mitigation approach are identified. Common to all suggested mitigation measures is identification of the root cause and appropriate reaction to limit the environmental consequences of each issue.

1.3 G.6 - Borrow Areas Development and Closure Plan

1.3.1 Executive Summary

Under the terms of Water Licence NWB1NAN0208 issued by the Nunavut Water Board (NWB), CanZinco Ltd., the current owner of the Nanisivik Mine is responsible for continuation of on-site environmental protection activities and developing for submission and approval a Reclamation and Closure Plan ("RCP").

The Nanisivik Mine 2004 RCP has been developed, as per the terms of the Water Licence as a series of stand-alone documents, each addressing in detail the information and proposed closure measures for one specific component or topic area. This document and the information presented herein are provided in response to the requirements for report Part G Item 6, the Quarry Development and Reclamation Plan.

In accordance with Part G Item 6 of the Water Licence, this report provides the following requirements for Quarry Development and Reclamation Plan:

The Licencee shall submit to the Board for approval a report assessing all quarries required for shale cover construction, which shall include but not be limited to:

1. *Description of extraction method and rate of production;*
2. *Identification of waste/overburden volumes and disposal sites;*
3. *Description of final quarry geometry and reclamation measures; and*
4. *Maps, where appropriate, showing sources and stockpile locations of all borrow materials.*

In summary, this Quarry Development and Reclamation Plan report provides details for the following components:

- Development plans for four quarries.
- A detailed reclamation and grading plan for the developed quarries at closure.
- A monitoring plan to assess the extracted material used for closure.
- A series of contingency plans that may be implemented should the need for more material arise.

At the current time, Nanisivik Mine has permits for seven shale quarries:

- Landfill Quarry.
- Mt. Fuji Quarry.
- West Twin Quarry.
- Shale Hill Quarry.
- Road Quarry.

- Area 14 Quarry.
- East Twin Quarry.

Quarry permits for these sites are regulated either by the Government of Nunavut or Indian and Northern Affairs Canada.

At closure, shale cover will be required for the following facilities around the mine site:

- Surface Cell tailings and crest of West Twin Dike.
- Downstream face of West Twin Dike (including completion of shale cover for consistent grade).
- Tailings at the toe of West Twin Dike.
- Transition zone tailings at toe of West Twin Dike.
- Test Cell tailings and Test Cell Dike.
- Transition zone tailings at the toe of Test Cell Dike.
- Landfill.
- West Open Pit.
- East Open Pit.
- Area 14 Waste Rock Pile (including completion of existing cover with armouring sand & gravel).
- Oceanview Pit
- Oceanview Portal Site (former ore stockpile pad)
- East Trench.
- Mill Area.

In addition to the shale cover at these locations, a top layer of sand and gravel armouring will be required. This material will be obtained from the Twin Lakes sand and gravel deposit, located between West Twin Lake and East Twin Lakes. The total in-place volume of shale required for the covers is estimated to be about 794,400 m^3. The total in-place volume of sand and gravel armouring required is estimated to be about 180,350 m^3. The volumes are based on the designs, as reviewed in detail in the Cover Design Report, (Part G, Item 4), the Rock Piles and Open Pits Report (Part G, Item 8) and the Land fill Closure Report (Part G, Item 17).

This report describes the quarry development and reclamation plan for four quarries, which have the potential to provide a total in-situ volume of 1,350,000 m^3 of shale cover material. The Twin Lakes sand and gravel Quarry contains an estimated volume of 375,000 m^3 of material within the upper 2 m. Due to the proximity of West Twin and East Twin Lakes, sand and gravel extraction will be limited to the portion of the deposit above the average level of West Twin Lake (elevation 371 m).

All quarries will be operated and reclaimed according to the relevant guidelines and regulations. In general, most of these requirements are embodied within the conditions of the Water Licence and the individual quarry permits. Relevant guidelines include "Guidelines for Abandonment and Restoration Planning for Mines in the Northwest Territories", "Reclamation Guidelines for Northern Canada" and "Environmental Guidelines, Pits and Quarries". The following operational and design related guidelines have been applied to the Nanisivik quarries

- All quarrying to be done in accordance with Territorial Mining Safety Act.
- Maintain 30 m buffer distance from adjacent water bodies.
- Plan winter operations in areas where access on firm ground is not possible to avoid rutting.
- Implement drainage and erosion control measures.
- Working benches of 5 m high and minimum 5 m wide.
- Soil slopes $\leq$ 2 Horizontal : 1 Vertical (2H:1V).
- Final rock slopes $\leq$ 1H:1V.
- Implement chemical and hydrocarbon storage, disposal and spill control program.
- Clean up all debris, garbage and unused explosives.
- Prepare plans for eventual abandonment and restoration.

- Re-contouring of excavations wherever practicable.
- Post-closure monitoring

The shale quarries are all located within the Lower Victor Bay Formation, comprising an interbedded sequence of fissile, dark grey to black shale and light-grey, planar-bedded dolomitic mudstone, approximately 180 m thick. The Twin Lakes sand and gravel consists of quartz sand, gravel and cobbles derived from quartzite. This unit is characteristically stained a reddish colour by hematite and was deposited as reworked glacial material by local streams.

The quantities of shale in each quarry were estimated on the basis of the exposures of shale in the existing working faces, supplemented by several shallow drill holes to confirm the depth of cover and lateral extent of the deposit. More drilling will be carried out during quarrying operations to help delineate the final quarry limits. The quarry development plans provide for 1,350,000 m^3 (in-situ) of shale cover material, which is about 1.5 times the estimated volume required. If the cover quantity needs to be increased, additional volumes are available from the other quarries at the mine.

Core samples and surface grab samples from existing stockpiles were analyzed for Acid-Base Accounting (ABA) and long-term kinetic testing. The test results determined that the shale has significant neutralizing potential and did not release dissolved metals.

The majority of the shale production will come from the Mt. Fuji Quarry and the West Twin Quarry. These two quarries have sufficient resources to supply all the shale required. The East Twin Quarry may be used to provide shale as well, however access is limited to periods of time when the ground is frozen. The Landfill Quarry will be used to provide shale for the landfill cover due to its proximity to the area.

Quarries will be developed using 5 m high benches with a working face of 84° (1H:10V). Upon closure, the benches will be reduced and the final overall rock slope will be 33° (1.5H:1V). Final soil slopes will be 18° (3H:1V). The quarry floors will be sloped at a final grade of 1% to promote drainage. The shale benches will be broken by drilling and blasting or ripping, as required.

The theoretical maximum extraction rate was calculated for each quarry based on the available mine fleet, cycle times, and loads per truck. The calculation was based on actual on-site productivity and equipment data provided by CanZinco for extraction and placement of shale at the West Twin Disposal Area. Assuming the Mt. Fuji Quarry and the West Twin Quarry are both operated simultaneously, the maximum extraction rate is 2,436 m^3/day, based on a 20-hour day. This volume is the in-situ volume in the quarry material. It was assumed that drilling, blasting and ripping production would be able to match this extraction rate.

To estimate a maximum extraction rate for the East Twin Quarry, it was assumed that the other two quarries were exhausted. The maximum extraction rate in this case was estimated to be 2,947 m^3/day. Similarly, the Twin Lakes sand and gravel Quarry was assumed to be in operation only after completion of shale quarry operations. The maximum extraction rate was estimated to be 2,526 m^3/day.

In reality, the actual extraction rates may be less than the above theoretical estimates due to the following factors

- Scheduling of quarrying and material placement at various locations.
- Equipment availability.
- Weather conditions and access.

During quarrying, technical monitoring personnel, in combination with the Site Supervisor will be present. In the quarry, these personnel will be responsible for visually assessing the material to reject unsuitable rock units such as pyrite, rocks containing sulphides and dolostone rock units. These materials can easily be distinguished from the dark grey –black shale on the basis of colour and physical characteristics. In addition, monitoring personnel will ensure that the material does not contain oversize pieces or excessive fines and that the extracted material conforms to the required specifications. Monitoring and supervisory

personnel will also inspect the blasted quarry walls, determining scaling requirements and ensuring that the overburden slopes are graded to the appropriate angle for a safe work area.

During excavation, survey control will be required to lay out pit geometry and grades, as well as permitted boundaries. The locations of all boreholes drilled to verify shale quantities will be recorded.

Reclamation measures have been developed to ensure minimal ongoing maintenance. Due to the sparse vegetation and limited growing season at the mine site, re-vegetation will not be carried out. Final pit slopes and grades will be established and surveyed. Inspection personnel will locate the final configuration of any berms and erosion control requirements. A detailed survey of the area will be undertaken to provide as-built drawings of the final closure of the quarries.

1.4 G.7 West Twin Disposal Area Surface Cell Spillway Design

1.4.1 Executive Summary

Breakwater Resources Ltd. retained Golder Associates Ltd. to provide geotechnical and hydrological design support for the Nanisivik Mine Closure. This report specifically addresses Part G, Item 7 of the Water Licence, the design of the West Twin Dike Spillway.

The principle closure objectives for the West Twin Disposal Area (WTDA) are to mitigate the potential long term environmental impacts and to return the land to a condition similar ot pre-mining development. The closure concept is to restrict the transfer of oxygen to the tailings, and also to minimize the transport of any available metals. At closure, drainage from the WTDA will occur passively, without the need of manpower to operate siphons. For this reason, a dike spillway and drainage channel will be constructed at closure to drain seasonal runoff from the Surface Cell to the Reservoir. The spillway has been designed to safely pass severe storm events. Tailings, which are currently exposed in the Reservoir will either be covered or re-located below a minimum water cover depth of 1.0 m. This will limit the potential for scouring of tailings at the outlet of the spillway.

The location of the spillway, the spillway invert elevation and the tailings cover are intrinsically linked. Several options were considered before selecting the proposed configuration. Subsurface investigations done at the proposed location included boreholes, test pits, thermocouple installation, and laboratory testing of soil and bedrock samples. The geologic conditions inferred investigations comprise the following stratigraphic units: till overlying frost shattered bedrock overlying competent bedrock.

The spillway will convey run-off from the Surface Cell to the Reservoir. The Surface Cell will be graded and covered to direct runoff to the spillway. The spillway invert will be Elev. 384.0 m, and the normal water level in the Reservoir will be 369.0 m. The spillway has been designed to convey a 24-hour Probable Maximum Precipitation (PMP) storm event estimated to produce 140

mm of rainfall in 24 hours. The extreme daily snowmelt is estimated to produce 155 mm of runoff but the peak flow would be less due to a more even distribution over the event period. The estimated peak flow over the Surface Cell Spillway is approximately 5.2 m^3/s, resulting in an peak water depth of approximately 0.52 m at the spillway inlet. The flow depth would decrease to about 0.31 m in steeper portions of the spillway.

The spillway will consist of a 6 m wide open channel with the base founded generally in intact bedrock. Where the base is located in frost-shattered bedrock or overburden, erosion protection consisting of rip rap stone with mean size 300 mm will be provided to a flow depth of 0.6 m. Rip rap bedding and filter layers will be provided beneath the rip rap to prevent the movement of soil through the coarse rip rap. The spillway outlet structure includes a plunge pool to force a hydraulic jump and a flared outlet channel so calm flows report to the Reservoir with minimal energy. Erosion protection will not be required where the channel base will be in intact bedrock.

The construction is estimated to involve about 48,800 m^3 of excavation and approximately 400 m^3 of fill for erosion protection. Construction supervision will be important to ensure compliance with design assumptions as design revisions may have to be implemented to accommodate variations in ground conditions. During construction, sampling and laboratory testing of both in situ materials and fill materials is required.

Routine surveillance is required to identify ice blockage or damming that could affect the performance of the spillway or result in a reduced freeboard to the crest of the West Twin Dike. A service road will be provided along the full length of the spillway to allow for periodic inspection and maintenance which may include removal of soil resulting from slope movements and regarding due to settlement from thawing.

1.5 G.8, Rock Piles and Open Pits Closure Plan

1.5.1 Executive Summary

Mining operations at the Nanisivik mine permanently ceased in 2002. CanZinco Ltd., the mine owner, is submitting a Reclamation and Closure Plan to the Nunavut Water Board in the format specified in the Water Licence. This report, the Rock Piles and Open Pits Closure Plan, fulfills the requirements for Part G, Item 8 of the Nanisivik Water Licence and represents one component of the Closure and Reclamation Plan submission.

Underground and open pit mining operations necessitated the development of surface stockpile areas for development waste rock. The rock types represented in the surface rock piles are a mixture of the various rock types encountered in the underground and open pit mines. This mixture includes a range of rock types from the host carbonaceous rock types to massive sulphide waste containing predominantly pyrite (iron sulphide) mineralization. The acid rock drainage characteristics of the waste rock varies from strongly potentially acid generating to acid consuming. All of the waste rock contains substantial neutralizing potential, due to the carbonaceous host rocks, and the acid generation potential is largely controlled by the sulphur content.

CanZinco has undertaken progressive reclamation of the surface rock piles for more than decade. Waste rock and rejects from the dense media separation plant have been relocated from surface into, primarily, the

underground workings mine and, since approximately 2000, into the East Pit and Oceanview open pits. This work was linked to both mine operations, where waste rock was required as backfill for mining, and to progressive reclamation of the open pits as the placement of waste rock contributed to backfilling of the pits. The progressive reclamation of rock piles has effectively relocated in the order of 178,000 m^3 (approximately 70%) of the total volume of waste rock that was on surface. The current volume of waste rock remaining in the various rock piles is estimated to be 69,641 m^3.

The open pits contain exposures of massive and disseminated sulphides (predominantly represented by pyrite mineralization) in the walls and floors. These exposures are largely discreet zones within the carbonaceous host rocks that generally form the bulk of the exposed rock. A large portion of the backfilling requirement at the East Open Pit and Oceanview Pit was completed during the progressive reclamation program.

The specific reclamation objectives for rock piles and open pits are:

1. Minimize the risk of ARD or metal leaching; and
2. Provide a safe surface environment that matches the natural conditions.

A review of the ARD characterization information led to the following relative risk classification of the rock piles and open pits:

1. Highest Risk: K-Baseline and 09-South rock piles;
2. Moderately High Risk: West Adit/02 South rock pile, East Open Pit and (assumed) East Adit Trench;
3. Moderate Risk: East Adit rock pile, Area 14 rock pile and (assumed) DMS rejects storage area;
4. Low Risk: West Open Pit; and
5. Lowest Risk: West Adit Access Road, Oceanview rock pile and (assumed) Oceanview Open Pit.

The overall approach to achieving the reclamation objectives is to apply the most appropriate combination of one or more of the following reclamation measures:

1. Relocate waste rock to eliminate or reduce the requirements for surface reclamation at the pile location:
2. Fill open pits to achieve a smooth surface contour that prevents surface ponding and provides a safe surface environment;
3. Provide a thermal cover such that the covered materials freeze into permafrost;
4. Assess the net negative effects of intrusive reclamation work against the potential long term environmental risk; and
5. Institute a monitoring and contingency program.

Where a thermal barrier cover is to be placed, the proposed cover design is the same as proposed for the landfill facility as follows:

1. The maximum slope of a cover will be 3H:1V or 18 °;
2. A two-layer thermal cover with a total thickness of 2.20 m will be placed above the waste;
3. The upper erosion-resistant capping layer shall consist of a durable, erosion resistant material with a thickness of 0.25 m. The selected material is the Twin Lakes sand and gravel;
4. The underlying layer will be shale with a thickness of 1.95 m to provide a minimum total thermal cover thickness (in combination with the surface layer) of not less than 2.20 m.
5. A quality control program will be implemented to ensure that cover materials meet the design specifications and are constructed in accordance with the design drawings. This program will include survey control, materials testing, construction monitoring and documentation.

The main objective of the performance monitoring program is to monitor the reclamation cover's performance in each location under three areas (seepage water quality, ground temperature, and physical

stability) and to report the results. The program is to be conducted during the 2-year reclamation period and the 5-year closure period.

In the event that the covers do not perform as expected, then some or all items of the contingency plan should be implemented. The components to the contingency plan that should be considered for implementation depending on the specific circumstances include:

- increased frequency of sampling/monitoring and data review by the technical professional;
- repair of any erosion of the cover;
- placement of additional cover material to increase the cover thickness; and
- extension of the period of performance monitoring.

1.6 G.9, Reclamation and Closure Monitoring Plan

1.6.1 Executive Summary

The Nanisivik Mine 2004 Reclamation and Closure Plan ("RCP") has been developed, per the terms of the Water Licence, as a series of stand alone documents, with each document providing, information and proposed closure measures for one specific component or topic area. The Reclamation and Closure Monitoring Plan, this document, is provided in response to the requirements of Part G, Item 9 of the Licence. The Closure and Reclamation Monitoring Plan ("Monitoring Plan") is a full description of the rationale for the proposed monitoring activities and detailed descriptions of the proposed activities.

The Monitoring Plan is 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 proposed mine reclamation in the activities in the RCP, are designed to stabilize the site (both chemically and physically) and provide for land use similar to the pre-mining conditions. With this in mind, the Monitoring Plan should provide the means of assessing when the site has achieved, as nearly as possible, those conditions.

The Monitoring Plan has been developed in the context of two time periods: the Reclamation Period; and the Closure Period

The **Reclamation Period** encompasses the period of active physical reclamation of the mine site and the completion of the major activities proposed in the Mine Closure Plan. This period is currently anticipated to be of two-years duration: 2004 and 2005. During the Reclamation Period, sufficient manpower will be present at the site to follow a rigorous monitoring schedule.

The **Closure Period** immediately follows the Reclamation Period. During the Closure Period, only relatively minor maintenance work is planned at the mine site and monitoring will be focused on providing information for assessing the performance of the reclamation measures. The Closure Period is designed for a duration of 5 years subsequent to the Reclamation Period, from 2006 to 2010. As there will not be a continuous manpower presence at the mine site during the Closure Period, the monitoring programs will be carried out during discreet site visits and, to as great a degree as practical, by trained, local technical assistants from the community of Arctic Bay

Monitoring throughout both the Reclamation Period and the Closure Period will include the following components:

- Water quality monitoring
- Geothermal monitoring
- Confirmatory sampling of soils
- Physical stability of earth structures

Water quality monitoring objectives are intended to:

1. Fulfill the requirements of the Water Licence;
2. Fulfill the general objectives of the Reclamation Performance Monitoring Plan by:
(a) collecting location-specific information to monitor the success of location-specific reclamation measures; and
(b) collecting general information to assess the quality of water entering Strathcona Sound;
3. Work in concert, as appropriate, with the monitoring provisions of the MMER as enforced by Environment Canada; and
4. Carry forward existing monitoring locations such that trends spanning the mine-closure milestone can be assessed.

In order to meet the water quality monitoring objectives a total of 25 water sampling stations have been identified. These stations are located in discreet flowpaths where water collects and can be sampled at a consistent location. In addition, each sampling event will also include sampling of ephemeral surface seeps that may be observed and that appear to relate directly to any of the reclaimed areas of the mine site.

The metal loading studies that were conducted and reported during mine operations will also be continued through the Reclamation Period and Closure Periods. These continued studies will use the information collected through the water quality monitoring program to estimate the loading of metals in Twin Lakes Creek from various sources and to characterize temporal and spatial trends.

The on-site laboratory is no longer equipped to perform water analyses and, therefore, this will be conducted at an off-site laboratory. The laboratory that is used will be accredited by the Canadian Association of Environmental Analytical Laboratories. Analyses for total suspended solids will continue to be conducted on-site.

Geothermal monitoring objectives are intended to:

1. Fulfill the requirements of the Water Licence;
2. Fulfill the general objectives of the Reclamation Performance Monitoring Plan by collecting location-specific information to monitor the success of location-specific reclamation measures;
3. Fulfill the objectives of the location-specific closure plans; and
4. Carry forward existing monitoring locations that meet the current needs such that trends spanning the mine-closure milestone can be assessed.

To accomplish these objectives a total of 78 geothermal instruments will be monitored on a regular basis throughout the 2-year active reclamation period and the 5-year post closure period. Four types of monitoring instruments will be used: thermistors; thermocouples; frost gauges; and vibrating wire piezometers. These instruments have been successfully used on-site through mine operations for their various specific purposes.

Confirmatory soil sampling will be performed to confirm the success of contaminated soil remediation. The objectives of the soil remediation plan are realistic and achievable. The objectives are to capture at least 95% of soil containing contaminants in excess of the SQRO's in each remediation area. Contaminant concentrations in any residual soils will not exceed twice the SQRO's.

During remediation, on-site screening will be undertaken in a consistent grid-based basis to provide an indication of remedial progress. Excavation of contaminated sols will proceed until the on-site screening procedures indicate that the excavation objectives have been achieved. At that time, a suite of confirmatory

samples will be collected and analysed at an off-site laboratory. Backfilling of excavated areas or other similar work in the areas of excavation will proceed only subsequent to the receipt of results from the off-site laboratory confirming that the objectives have been met.

The **physical stability of earth structures** will be determined via annual inspections by a professional geotechnical engineer registered in Nunavut. These inspections will examine all existing and reclaimed earth structures, water diversions, rock slopes and soil covers. The inspection will be conducted during later summer such that thaw conditions are observed.

Areas targeted, as part of the physical stability assessments will include:

- West Twin and Test Cell Dikes;
- West Twin Surface Cell Spillway;
- West Twin Reservoir Outlet;
- West Twin Tailings Cover;
- East twin Lakes outlet area;
- Landfill Cover;
- Area 14, East Open Pit and West Open Pit covers; and
- Oceanview and K-Baseline areas.

Despite the fact that the closure monitoring period is defined as 5 years (until 2010), it is understood that the overall timeframe for the Monitoring Plan is somewhat "open-ended". Environmental performance monitoring will continue until sufficient data has been collected to confirm that long term behaviour of the site will meet the reclamation objectives.

In order for the Monitoring Plan to be successful, the information that is collected must be reviewed and, where necessary, acted upon in a timely manner. This includes review and action by CanZinco for site management purposes and review and action by the NWB or CanZinco regarding compliance with the terms of the Water Licence.

A quarterly data report will be filed with the NWB in compliance with *Part H, Item 30* of the Water Licence. It is anticipated that the file would then be posted, thus providing public access and an appropriate level of transparency into the monitoring process.

An annual environmental report will also be filed with the NWB in compliance with *Part B, Item 16* of the Water Licence. This report will include a review and comparison of the information with previous year's data and will identify any developing spatial or temporal trends. It is anticipated that this report will also be posted and will allow all parties to assess the performance of the reclamation actions to that date

A Comprehensive Assessment Report that summarizes information garnered from the data will be filed with the Nunavut Water Board in 2010. The report will follow the Terms of Reference which are required under Part G, Item 22 of the Water Licence. This report will assess the "environmental stability" of the site in consultation with the appropriate communities, agencies and organizations. Based on the collected data, long term projections will be made on the expected behaviour of the site. If this review demonstrates that the site is currently stable and is expected to stay stable in the long term, then CanZinco will anticipate a release from further monitoring obligations