June 26th, 2013

Phyllis Beaulieu
Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0

Cc: Ian Parsons, Regional Coordinator, Aboriginal Affairs and Northern Development Canada (AANDC)
Murray Ball, Manager of Water Resources, AANDC

Dear Ms. Beaulieu,

Re: 1AR-NAN0914 - Response to AANDC Inspection Observations

This note is provided in response to a letter from the Aboriginal Affairs and Northern Development Canada (AANDC) dated April 19, 2013, and discussing outstanding reclamation issues at the former Nanisivik mine property.

The table below includes Nyrstar's responses to the comments and recommendations provided by the AANDC. It should be noted that many of the observations raised by the AANDC lack clarity and additional information is requested in order for Nyrstar to address the AANDC's concerns. Additionally, we note that the observations date from inspections carried out in 2010 and 2011 and, as such, some of the issues highlighted by the AANDC have already been addressed and/or are no longer relevant.

Several of the recommendations provided by the AANDC suggest that an updated Abandonment and Restoration (A&R) Plan be prepared. The only part of the site that is subject to an A&R plan[1] is the former tank farm area where soil remediation works are still ongoing. The remaining parts of the site have already been rehabilitated and are being monitored as per the requirements of the water licence. As such, no A&R plan is in place for these areas.

Area	AANDC Comment/Recommendation	Nyrstar Response
Area 14, Oceanview and K-Baseline Areas	There are several acidic seeps and drainage occurrences to be remediated within three areas.	
	i) Area 14 - Acidic seepage from Area 14 is currently flowing southward down the roadway. At this time it is not clear whether this seepage is flowing to Chris Creek or to East Twin Lake. There are also other residual acidic seeps at Area 14 and some exposed sulphide-bearing waste rock.	Further information is required in order for Nyrstar to address these seeps and drainage occurrences. Please provide photos, sketches and/or GPS coordinates to enable us to understand the location and nature of the seeps. Also, does the AANDC have any information on the pH and volume of the seeps observed?
	ii) Oceanview - There are several acidic seeps from the covered sulphidic waste piles. Surface runoff is draining into the	Natural exposure of sulphidic material was known to be common throughout the Oceanview area. The geothermal monitoring results from the cover at the

[1] Stantec, 2010. Abandonment and Reclamation Plan, Fuel Tank Farm, Former Nanisivik Mine Site, Nunavut. January 8, 2010.

	Oceanview open pit area and a collection pond of iron-rich seepage has developed from the Oceanview west raise cover area.	Oceanview pit indicate that the material beneath the cover has frozen back and the annual active layer thaw is confined within the cover materials throughout the year[2]. Any ARD related staining down slope from the Oceanview pit is due to historical ARD seepage through this area. Seepage emanates from the toe of the cover system, however it is no longer part of the monitoring program as there were no previous concerns with respect to water quality in this area. Monitoring of a seep 159-18 and a sump 159-19 at Oceanview was discontinued by 2009 with the issuance of the current licence. Water quality monitoring indicated neutral conditions from seep 159-18. As reported in the annual reports on July 6, 2006 and June 20, 2007 low pH readings were evident at 159-19. The rest of the season (before and after those dates) the water ranged from 6.2 to 8.2. In 2005 the lowest pH was 6.95 on July 14. Any staining noted on or up-gradient of the Oceanview pit is related to exposure of natural sulphidic material outside the footprint of the pit. As such, no further action is planned at the Oceanview open pit. Any ponding occurring in the proximity of the Oceanview west raise is related to exposure of natural sulphidic material in the vicinity of the raise. The raise is backfilled and frozen back, hence the seepage does not emanate from the raise. Additional grading could be completed to remove the ponding, but no additional measures are planned to address the natural source of the acidic water. Due to undulating nature of the topography in this area, if the current ponding area were backfilled it is likely that ponding would occur elsewhere. Thus, it is uncertain if there is value in the effort that would be required for this grading activity.
	iii) K-Baseline - Exposed sulphide-bearing rock was observed below the road between Oceanview and K-Baseline. This material is producing drainage that may be acidic.	Sulphidic waste rock piles were present along the road between Oceanview and K-Baseline prior to site remediation. The waste rock piles were relocated to either the Oceanview west raise or K-baseline portal and incorporated under the soil cover. Staining noted below the road in this area is due to historical ARD seepage from the waste rock piles and exposures of natural sulphidic material. Based on the above, no further action is planned in the K-Baseline area.
	Recommendation: An updated Abandonment and Restoration (A&R) Plan should provide detailed assessment and	Potential remedial activities required in the Area 14, Oceanview and K-Baseline Areas will be documented and recorded. However, given that the active restoration work in these areas has already

[2] BGC Engineering Inc. 2013. 2012 Annual Geotechnical inspection, Nanisivik Mine, NU. Submitted to Nyrstar February, 2013.

	remediation plans for the acidic seeps.	been completed, no Abandonment and Restoration (A&R) Plan will be developed.
Shale Quarry Area	The shale quarry area has not been remediated. The main access road for the site is immediately adjacent to the quarry and if the area were to remain as is then road stability would be jeopardized. Recommendation: It is recommended that this area be remediated and that the detailed plans of the remediation be included in an updated A&R Plan.	There were several shale quarries developed around the Nanisivik Mine site as part of the reclamation efforts undertaken in 2004 and 2005. It is uncertain which quarry AANDC is referring to in the above comment. All quarries were reclaimed according to the quarry development and reclamation plan[3]. The reclamation of these quarries or 'borrow areas' was documented in the Reclamation Project Completion Report[4]. Additional information is requested regarding which quarry and what issues AANDC is referring to in the above comment. It would be helpful if AANDC can provide photos, sketches and/or GPS coordinates of these observations.
Port, Tank Farm Area, Industrial Complex Yard and Barrel Dump	The dock and port area are currently owned by Department of Fisheries and Oceans (DFO), and the Canadian Coast Guard (CCG) is operating the site. The port area has been fully reclaimed except for the former fuel tank farm.	N/A
	Concentrate Storage Shed - The storage shed has been dismantled leaving only the concrete pad. At the request of the community, the pad was cleaned and subsequently buried to assure no residual concentrate was present at surface. It is understood that the CCG subsequently removed a large percentage of the cover on the pad in order to use the pad as a laydown area. The pad is now exposed and residual concentrate is evident on the pad.	The concentrate storage shed pad was remediated in accordance with the approved closure and reclamation plan. The residual concentrate was picked up by loader, followed by men with hand shovels and a mechanical broom. Small patches of concentrate remained in hollows in the concrete prior to it being covered with a soil cover. Upon removal of the soil cover by the CCG trace patches <3 cm in diameter were observed. No further remedial measures are required.
	Tank Farm - the fuel storage tanks have been dismantled and the steel is stockpiled at the port awaiting removal. There is about 5,000 m^3 of contaminated soil at the tank farm that is being remediated. The soil will be treated in 8 small bio-treatment piles in an area just north of the concentrate storage pad. The treatment of fuel -contaminated soils is expected to last for another 3 to 5 years. It is understood a new tank farm will be built to support port operations under the control of DFO.	Excavation and treatment of the fuel-contaminated soil is ongoing. Current schedules indicate the remediation works will be completed by the end of 2015.
	Barrel Dump - There are approximately 250 barrels of contaminated sludge (understood to be from tank bottoms) remaining on site.	All barrels of sludge generated from the demolition of the fuel tank farm were shipped south for disposal by CanZinco in 2011.

[3] BGC Engineering Inc. 2004. Quarry Development and Reclamation Plan. Submitted to CanZinco Ltd., February 2004.

[4] BGC Engineering Inc. 2009. Nanisivik Mine Reclamation Project Completion Report. Submitted to Breakwater Resources Ltd. January 2009.

		The CCG utilizes the laydown yard to store barrels of used oils and lubricants and other fluids pending shipment south for disposal. Drums originating from the CCG are typically on site for less than one year. Volco Northern Terminals Inc. also has ~85 drums on pallets at the laydown yard plus equipment stored at the Nanisivik Government Garage. The drums and equipment owned by this third party is pending shipment off-site. Since the drums remaining on site are not the responsibility of Nyrstar, no further actions are expected in regards to the 'barrel dump'.
	Hydrocarbons - Some hydrocarbon contaminated soil remains down gradient and around the fuel pump house.	The fuel pump house was removed from service in 2007 in order for the soil down gradient and around the building to be remediated[5]. The reclamation of residual contaminated soil at the fuel pump house was documented by SRK[6] The building was relocated several times prior to being dismantled and shipped off site in 2011.
	Recommendation: The barrel dump requires remediation followed by subsurface soil testing to assure there is no residual contamination from spilled/leaking barrels.	The reclamation of the laydown yard at the dock site was documented[5,6]. The barrels currently on site were not generated by the mine. No additional remedial measures are planned to address the use of the site by the CCG or third parties.
West Twin Lake Creek, Spillway and Area	There appear (from visual observations) to be some residual tailings on the steep banks of West Twin Lake Creek.	It is uncertain what area AANDC is referring to with this comment. It would be helpful if AANDC can provide photos/sketches/GPS coordinates of these observations. Further information is required to respond to this comment.
	West Twin Lake Creek Dike spillway is functioning as intended, however, minor deformation in the base and side slopes of the spillway have occurred. There is also a minor thaw settlement area (area of subsidence) near the spillway outlet.	The noted concerns within the West Twin Dike Spillway were addressed with additional remediation measures undertaken in 2012. Additional grading and placement of armour rock was undertaken in July 2012. These remediation measures are documented in the 2012 Annual Geotechnical Inspection Report[7]. The area will continue to be monitored during the annual geotechnical inspection to assess the effectiveness of the remediation measures.
	An area of water retention (ponding) has developed above West Twin Lake Creek Dike spillway.	The pond at the spillway inlet is of limited extent (less than 0.5 hectare) and of minimal depth (less than 0.3 m deep). The water from the Surface Cell and surrounding water shed (127 hectares) is directed to this area, by design, by a series of low gradient (0.5%) surficial drainage swales. Due to the coarse grained nature of the cover materials, water flow is generally subsurface. The water flows into

[5] Gartner Lee Limited 2008. Nanisivik Mine Summary of Contaminated Soils Remediation, Interim Close Out Report: Dock Area, April 2008.
[6] SRK Consulting Inc. 2009. Nanisivik Mine Summary of Contaminated Soil Remediation Progress – September 10, 2008, January 2009.
[7] BGC Engineering Inc. 2013. 2012 Annual Geotechnical inspection, Nanisivik Mine, NU. Submitted to Nyrstar February, 2013.

		the West Twin Dike spillway and subsequently into the Reservoir. The visible water flowing through this area is not considered to be standing water. Whether the water is exposed at surface or not, the same volume of water will be present at this location. Backfilling (covering) the area would provide saturated voids within the rockfill and the thermal effects are expected be the same. Additionally, the size of the pond has noted to be reducing over time, as noted in the annual geotechnical inspection reports. As such, no modifications to the Surface Cell cover adjacent to the inlet of the spillway are currently planned.
	Recommendation: These areas require additional remediation and maintenance to prevent further degradation.	No further action is planned for these areas beyond visual monitoring.
Crown Pillars and Portals	i) Oceanview Portal – A previous thaw settlement noted in the southwest corner has not been repaired (backfilled), however observations from year to year site inspections indicate that the thaw settlement area appears to have stabilized.	No additional deformation has been noted at this location for several years, as noted in the 2012 annual geotechnical inspection report, and it is considered to have physically stabilized. No additional reclamation efforts are planned at this location.
	ii) 17 N Portal – A previous thaw settlement feature was observed in 2008 and was subsequently backfilled.	No additional deformation has been noted at this location for several years, as noted in the 2012 annual geotechnical inspection report and it is considered to have physically stabilized. No additional reclamation efforts are planned at this location.
	iii) Crown Pillars in East and West Open Pits – some cracking has been observed at surface above these crown pillars.	The cracking at both crown pillars has been observed to have stabilized, as noted in the 2012 annual geotechnical inspection report. The cracks will continue to be visually monitored to confirm that this stabilization has occurred.
	Recommendation: Previous thaw settlements and crown pillar cracking events should be monitored for any degradation or subsidence events. Any further remediation plans should be contained in an updated A&R Plan.	Each of these areas will continue to be visually monitored during the annual geotechnical inspections to verify that they have physically stabilized. No additional remediation efforts are planned.
Covers	i) The East Open Pit cover has minor erosion rills and one minor tension crack.	Minor erosion of the armour layer at the East Open Pit was anticipated due to the material used, as noted in the covers completion report[8]. Because of this, the armour layer thickness was increased to accommodate loss of the some of the fine-grained fraction of this material over time.
	ii) Surface Cell Tailings Cover – The thermistor data shows that this cell is freezing back as designed, however, there	The noted thaw settlement feature is isolated and has not increased significantly in size in recent years, as noted in the 2012 annual geotechnical

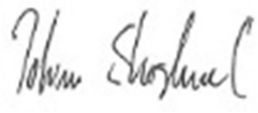
[8] BGC Engineering Inc. 2008. Surface Reclamation Covers As Built Report. Nanisivik Mine, NU. Submitted to Breakwater Resources Ltd. April 2008.

	was one area of thaw settlement along the south edge.	inspection report. No negative impacts to the performance of the overall cover system are thought to be associated with these small thermokarst features. As such, the surface of the cover system will continue to be visually monitored during the annual geotechnical inspection, but no additional remedial efforts are anticipated.
	iii) There has been some weathering and degradation of the shale used in the thermal surface covers. If this continues the effectiveness of the covers may be a concern.	Weathering of the shale cover materials is expected and is anticipated to enhance the performance of the cover systems. Hence, there are no concerns with weathering of the shale cover materials.
	Recommendation: Remediate the cover areas as required and continued monitoring cover integrity.	The covers will continue to be visually monitored as part of the annual geotechnical inspection of the site. No additional remedial efforts are anticipated at this time.
Other	1) Some slumping of cover material in the former blasting/explosives storage area has occurred and should be addressed.	There is no thermal cover in the former blasting/explosives area. The natural shale deposit in this area was re-graded to a uniform slope. However, some thermokarsting resulting from natural permafrost degradation in the area has occurred. Ground conditions in natural slope areas are sensitive to surface disturbance due to potential impacts to the underlying permafrost. Given the relatively minor nature of the surface disturbance in this area, and the likelihood that additional surface grading would result in further permafrost degradation, no additional remedial efforts are planned for this area.
	2) The former carpenter shop area across from the maintenance garage is poorly drained and requires grading and shaping to improve drainage and aesthetics of the area.	The grading and shaping at the Carpenter Shop area is scheduled to be completed by July 31, 2013, to improve site drainage and aesthetics.
	3) The thermistor cable in the Industrial Complex Cover requires additional backfill around the PVC pipe. AANDC recommends backfilling the hole as soon as possible to restrict surface water access.	The thermistor cable was backfilled in the fall of 2010. The cable continues to be monitored as part of the geotechnical monitoring program and no remedial efforts are anticipated at this location.
	4) Some cracks were noted on the concrete weir at the West Twin discharge from the polishing pond. A coffer dam was built and material was excavated in order to install a geothermal liner along the upstream side of the wall prior to backfilling. Regular monitoring of these features is recommended to ensure their effectiveness.	The wall and the water level upstream of the wall continue to be monitored as part of the ongoing geotechnical monitoring program.
	5) The East Adit Treatment Facility Dikes were breached in 2006. The flow through the Treatment Pond was observed to be relatively unimpeded. However, some water retention (ponding) has occurred. The area	No water has been observed to be ponding at the treatment pond since the dyke was breached in 2006. However, some minor ponding of limited extent has been observed at the former retention pond location. No water quality concerns at the

	of water retention (ponding) should be investigated and monitored to determine whether it is having a negative impact on the area.	treatment pond are anticipated as it does not collect water from the East Adit area. Run off from the East Adit area flows through the former treatment pond location. The retention pond is slowly being naturally backfilled with weathered shale being transported from up-slope. No additional remedial efforts are planned at this location.
Abandonment and Restoration	An updated Abandonment and Restoration Plan (A&R Plan) with options and alternatives to remediate the areas noted above as well as a monitoring plan, detailing how these areas are to be regularly monitored to ensure stability of the site, should be submitted to the Nunavut Water Board at the same time as the water licence renewal application.	As noted above, an Abandonment and Restoration Plan is in place for the remediation works being completed in the former tank farm area at the dock. Based on the information provided above, we do not believe that the comments raised by the AANDC warrant an update of the plan. The continued adequacy of the plan will be reviewed as part of the water licence application process and updates will be performed as necessary.
License Expiry	AANDC would like to remind the proponent that the water licence is set to expire on March 31, 2014, and the process for renewal of a Type A water Licenses may take close to a year.	Nyrstar is aware of the expiry date of the existing licence and has commenced preparations for the licence renewal.

I trust that the information provided above is clear and that it adequately addresses the AANDC's concerns related to the reclamation work completed at the Nanisivik mine site. Please do not hesitate to contact me by phone or email should you have any questions or comments.

Sincerely,



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