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August 14, 2014

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

Re: Former Polaris Mine – Supplemental Long Term Monitoring Program Water Licensing - Teck Resources Limited Technical Meeting Presentation and Responses to Technical Comments.

Dear Ms. Beaulieu;

Teck Resources Limited (Teck) is pleased to submit the attached responses to technical comments submitted by Aboriginal Affairs and Northern Development Canada (AANDC) and Environment Canada (EC) during the review of the water licence application for the Supplemental Long Term Monitoring Program (2014-2029) for Polaris. The responses are intended to facilitate discussion at the Technical Meeting scheduled for August 18, 2014.

In preparing the responses, Teck had positive discussions with AANDC by teleconference on August 12, 2014, as well as EC on August 14, 2014. Teck looks forward to provide any additional clarification to the parties and Nunavut Water Board staff during the technical meeting.

In addition to the responses, Teck has prepared a short presentation for the technical meeting to help facilitate discussion on the application. The presentation is in pdf format with page numbering so that parties can follow via teleconference.

Should you require any further information to facilitate the technical meeting please contact me.

Sincerely,



Bruce Donald
Manager Dormant Properties, Environment

C.c. David Hohnstein, Nunavut Water Board (david.hohnstein@nwb-oen.ca)
Sonia Aredes, Nunavut Water Board (sonia.aredes@nwb-oen.ca)
Murray Ball, AANDC (Murray.Ball@aandc-aadnc.gc.ca)
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Randy Baker, Azimuth (RBaker@azimuthgroup.ca)
Stephen Lines, Tunaley Lines & Associates (slines@tlaconsultants.ca)

Attachment: 1) Teck Responses to Technical Comments
2) Teck Technical Meeting Presentation

Teck Resources Limited Polaris Supplemental Long Term Monitoring Program Water Licensing			
Comment #	Comment	Recommendation/Observation	Teck Response
AANDC			
1-a	During a recent AANDC site inspection conducted on July 10, 2014. AANDC personnel found that there was visual evidence of possible minor subsidence in the same area as past subsidence events. The visual evidence included several holes of unknown depth, surface cracks and a few minor depressions.	In light of the recent 2014 AANDC site inspection, AANDC recommends that the geotechnical stability of the area of past and recent possible subsidence should be re-evaluated and that remediation plans for this area should be updated as required and submitted to the NWB for review and approval.	Geotechnical inspections of reclaimed facilities, including isolated areas of minor subsidence, were carried out between 2003 and 2011 by a professional Engineer and found to be stable. The photos shown in the AANDC 2014 inspection report appear to be consistent with past photos indicating that the site remains stable. At the request of AANDC, Teck will be carrying out an August 2014 monitoring visit as per the supplemental long term monitoring program and the geotechnical Engineer with long term experience at site will provide an update on reclaimed facilities and identify if there are any recent isolated areas where minor subsidence has occurred. The photo's representing potential subsidence do not appear consistent with what subsidence related to mining would look like and so particular attention to these features will be made provided they can be located. If AANDC has gps location of these features, it would allow certainty in locating them.
1-b	In the vicinity of the area of subsidence and the north portal there are galvanized metal culvert-like structures that are becoming unearthed. These structures were apparently used to line raise bore holes. The "culvert" ends exposed through the surface of the ground may be difficult to see from ski-doo or ATV and could pose a risk to people or wildlife in the area.	The licensee should develop a remediation plan to mitigate the risk from these structures, such as removing them if possible and ensuring the bore holes are appropriately backfilled.	The area noted appears minor, however Teck will investigate during the August 2014 geotechnical inspection.

Teck Resources Limited Polaris Supplemental Long Term Monitoring Program Water Licensing			
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1-c	There is an emergency shelter/cabin remaining on site.	Teck should confirm whether this shelter has been claimed by someone or an organization. Given the visual findings of the 2014 site inspection, and the possibility of further site work, Teck may require this shelter in the future. Teck should notify the NWB as to the end use of the shelter.	The small cabin was given to a local resident in Resolute for traditional activities. Teck will provide written confirmation of ownership.
2-a	<p>AANDC had requested, in a letter dated June 2, 2014 submitted to the NWB, that the licensee provide annual reports, including geotechnical inspection reports for 2012 and 2013 as required under Part B Item 6, Part H Item 27 and Part H Item 6 respectively of the current (expired) licence 1AR-POL0311.</p> <p>In a letter submitted to the NWB dated June 19, 2014 Teck responded to the above request by stating that no activity was conducted during 2012 or 2013.</p> <p>Teck also stated that they have adopted the approach outlined in the AANDC's Contaminated Sites program guidance document entitled Abandoned Military Site Remediation Protocol (INAC, 2009).</p>	AANDC observes that while alternate approaches may be suitable for future site management, Teck remains bound by the terms and conditions of their current (expired) water licence until licence amendments come into effect.	The administrative issue concernig the expiry of the previous licence was addressed in Teck's letter to AANDC dated July 31, 2014. Teck remains committed to the supplemental long term monitoring program and working with interested parties in this regard.

Teck Resources Limited Polaris Supplemental Long Term Monitoring Program Water Licensing			
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2-b	The licensee has proposed a new long-term geotechnical monitoring program for the Polaris Mine Site.	AANDC has reviewed the licensee's proposed long-term geo-technical monitoring program and recommends that the plan be approved and adopted into the next water licence. However, AANDC also recommends that if a geotechnical inspection indicates the need to conduct work on site, the inspection interval should be re-evaluated or if an AANDC inspector determines that on-site conditions pose a significant risk to people or the environment, then a geotechnical inspection should be conducted within two years, and the inspection interval should be re-evaluated.	Agreed.
3-a	AANDC had requested that the licensee provide the monitoring data for 2012 and 2013 as required under Part H Item 37 of the current (expired) licence 1AR-POL0311. In a letter submitted to the NWB dated June 19, 2014 Teck responded to the above request by stating that no activity was conducted during 2012 or 2013. Teck also stated that they have adopted the approach outlined in the AANDC's Contaminated Sites program guidance document entitled Abandoned Military Site Remediation Protocol (INAC, 2009).	AANDC notes that until the licence is amended through a water licence renewal process, Teck remains bound by the terms and conditions of the current (expired) water licence.	The administrative issue concernig the expiry of the previous licence was addressed in Teck's letter to AANDC dated July 31, 2014. Teck remains committed to the supplemental long term monitoring program and working with interested parties in this regard.

Teck Resources Limited Polaris Supplemental Long Term Monitoring Program Water Licensing			
Comment #	Comment	Recommendation/Observation	Teck Response
3-b	Teck has proposed a new long-term water quality monitoring program for the Polaris mine site.	AANDC has reviewed the new proposed long-term water quality monitoring program and recommends that this monitoring program be adopted into the next approved water licence.	Agreed.
4	Teck has indicated that fencing would be the best option in the event of further subsidence.	AANDC is not in support of creating permanent infrastructure that would likely require long-term maintenance in the event of further subsidence at the mine site during the post-closure period. Therefore AANDC recommends the option of placing a boulder barrier if safety becomes an issue due to subsidence.	Creating a boulder barrier would require significant heavy equipment and material, which are not available and it is therefore not reasonably feasible. Similarly, infilling subsidence areas is not reasonably feasible and not typically carried out at other sites in the south. Based on the geotechnical Engineer's inspections to date there is no need to implement mitigation measures for the minor subsidence areas, which have since stabilized. However, a feasible option if needed in the future based the geotechnical Engineer's report would be to install signage which would be more visible and a better communication tool than placing boulders.
5	The licensee is requesting a \$2,215,000 reduction in Security (from \$3,539,000 to \$1,324,000)	In light of the 2014 inspection results and the above comments and recommendations. At this time AANDC recommends keeping the security at its current amount of \$3,539,000.	Teck has provided a detailed security cost estimate with the application based on the scope of the supplemental long term monitoring program and consistent with water quality and geotechnical engineering assessments from 2003-2011. The detailed cost estimate provided by Teck also includes contingencies, and supports Teck's request to reduce the currently held security amount.
EC			
1 to 11	Migratory Birds, Wildlife, and Species at Risk	EC's specialist advice is provided pursuant to the Canadian Environmental Protection Act 1999, the pollution prevention provisions of the Fisheries Act, the Migratory Birds Convention Act (MBCA), and the Species at Risk Act (SARA).	Acknowledged. Please note that the Polaris site is fully reclaimed. There are no facilities or personnel at site and wildlife monitoring does not take place. Site crews visit the site for 1 or 2 days during the supplemental monitoring program schedule and take care not to disturb wildlife when at the site.

Teck Resources Limited Polaris Supplemental Long Term Monitoring Program Water Licensing			
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12	<p>The Azimuth Consulting Report (dated April 4, 2013 and addressed to Bruce Donald, Teck Metals Ltd.) letter describes the proposed long-term monitoring program for Garrow Creek. EC agrees in principal with the provided rationale for the proposed removal of cyanide, nitrate, nitrite and other nutrients, and radium 226. Similarly, EC agrees in principal that it is not necessary to monitor the historic Garrow Bay and reference locations. The proposed schedule for post-closure monitoring, i.e. Phase 1 from Years 1-5 and Phase 2 during Years 7, 10, 15 and 25 is in line with other northern projects.</p>	<p>EC recommends that the Proponent support the proposed changes in the monitoring program by providing a detailed summary of the post-closure monitoring data (for all parameters analysed) to date for Garrow Lake and Garrow Creek.</p>	<p>Please refer to the quarterly and annual reports on file with the NWB, which contain data on additional parameters.</p>

Teck Resources Limited Polaris Supplemental Long Term Monitoring Program Water Licensing			
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13	EC notes that the surface water quality and chemistry of Garrow Lake may be inferred from the water quality and chemistry of Garrow Creek. However, EC does not support the proposed reduction in vertical limnology and chemistry monitoring of Garrow Lake, which has been limited to collecting data in Year 25 (2029). This would result in an 18-year gap in collection of such data. The vertical limnology and chemistry monitoring proposed for Year 25 will provide a snapshot in time. In combination with Year 10 (2014) and Year 15 (2019) snapshots and early post-closure monitoring data, it is possible for trends to emerge. In the absence of the intervening Year 10 and Year 15 data, there will be a gap of 18 years (from Year 7 to Year 25). That would result in a lack of information on the condition of the pycnocline and the monimolimnion for over 70% of the proposed 25-year post-closure period.	EC suggests that it would be in the best interests of both the Proponent and the environment to conduct scheduled vertical monitoring to ensure any changes in Garrow Lake are noted earlier in the post-closure period. In addition to the proposed sampling at Year 25 (2029), EC recommends that vertical limnology and chemistry monitoring of the Garrow Lake centre location are also conducted in Year 10 (2014) and Year 15 (2019), in step with the schedule proposed for Garrow Creek water quality.	It is not feasible at this time to carry out vertical limnology and chemistry in 2014 due to the planning, equipment and resources required to coordinate before the August 2014 site visit. Based on the extensive monitoring to date, Garrow Lake is stable. However, Teck is agreeable to the addition of Garrow Lake monitoring in 2019 to bridge 2011 and 2029 lake sampling.
14	Quality Assurance and Quality Control (QA /QC)	In addition to the QA/QC measures described for the proposed long-term monitoring program for Garrow Creek, EC also recommends that a field blank is included, as described by the Metal Mining Technical Guidance for Environmental Effects Monitoring (EC, 2012).	Agreed.



Former Polaris Mine Water Licensing – Supplemental Long Term Monitoring Program

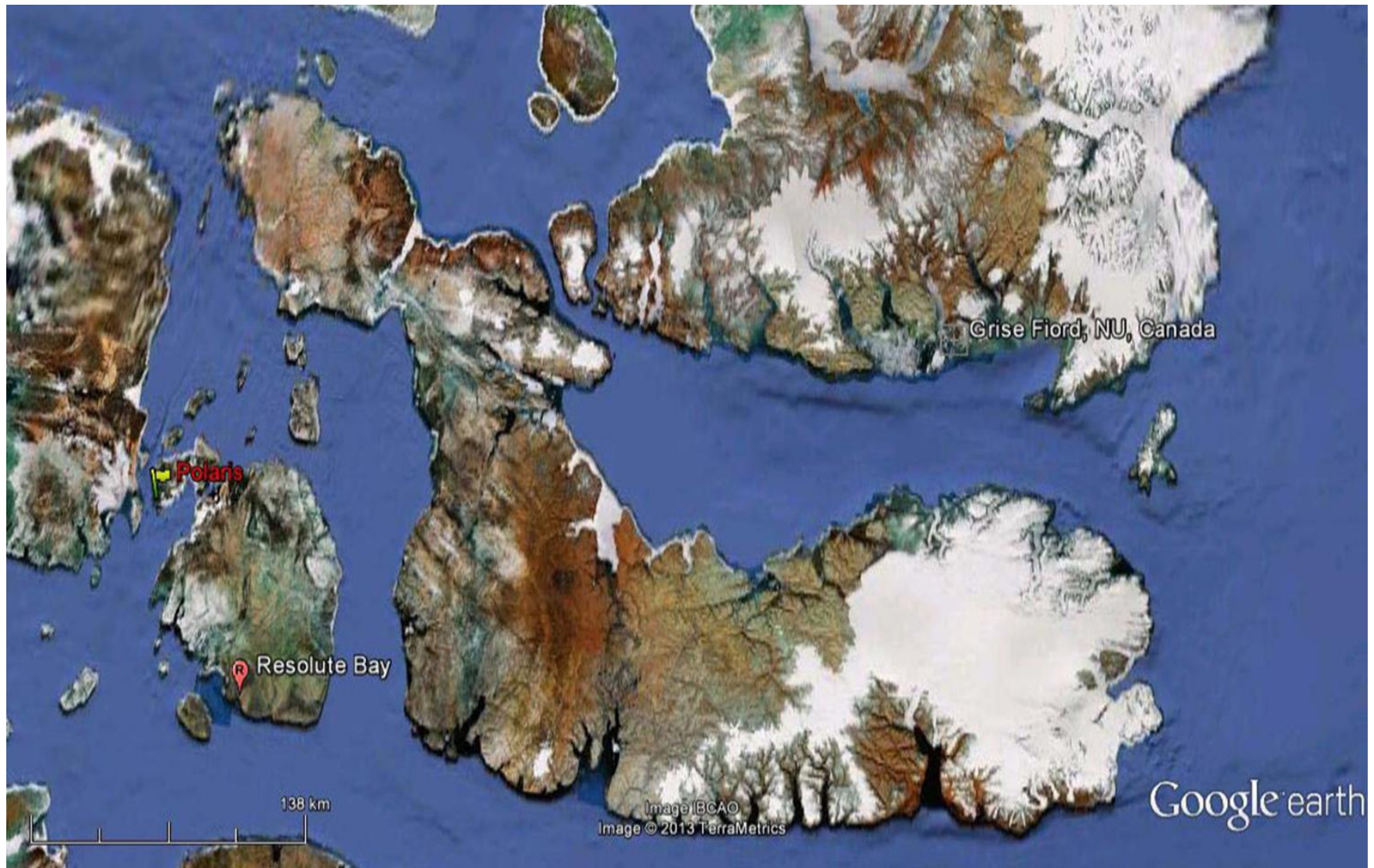
August 18, 2014 – NWB Technical Meeting
Bruce Donald, Manager Dormant Properties



Polaris 2003-2011

Supplemental Long Term
Monitoring (SLTM) 2014-2029

Key Topics



Polaris 2003-2011

Teck



- Lead & Zinc underground mine
- Operated from 1981 to Sept. 2002
- Produced 25 million tonnes of ore during its life
- Decommissioned & reclaimed Sept 2002 to Sept 2004
- Post-Reclamation Monitoring – 2004 – 2011

- **Teck completed the Decommissioning and Reclamation Plan (DRP 2001) as approved by the NWB through water licence 1AR-POL0311.**
- **Teck was released from MMER EEM in 2006 and has obtained Recognized Closed Mine status.**
- **There are no facilities, personnel or equipment remaining at site.**
 - One remaining cabin was given to a resident in Resolute upon request. Can also be used for safety purposes.
- **Post Closure Geotechnical and Water Quality Monitoring demonstrate success of the DRP, site stability, and no significant issues.**
- **Positive example of mine reclamation for Nunavut.**



- **SLTM events to occur on a decreasing frequency over time including 2014, 2019, and 2029.**
- **Scope of SLTM includes inspections by a geotechnical Engineer, and water quality monitoring of Garrow Creek in 2014, 2019, and 2029.**
 - Teck had proposed delaying the 2014 SLTM event until 2015 following water licence approval, but this proposal was not agreeable to AANDC therefore Teck returned to the original 2014 scheduling.
 - 2014 SLTM event will further address the comments noted in the AANDC inspection report and technical comments.
- **Garrow Lake Monitoring proposed in 2029. Following EC recommendation #13 Teck will add Garrow Lake to the 2019 SLTM event but not feasible or required for 2014.**
- **SLTM reports will be provided to the NWB for 2014, 2019 and 2029.**
- **Teck will submit a summary of outcomes for the August 2014 SLTM event at least 30 days prior to the comment deadline for the water licence (target of September).**

- **Licence term of 15 years required through to December 31, 2030.**
- **During the term of the Licence, and pending outcomes of the SLTM, Teck will require clarity from the NWB and AANDC on the process for cancelling the licence and being released from future obligations.**
- **Teck has provided an updated reclamation security cost estimate, with contingency for isolated areas of minor subsidence. Follow up to be provided September 2014.**
- **The conditions of the Licence must take in to account that the next scheduled SLMT event is in 2019.**

Thank you

Teck

