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Nunavut Water Board
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Public Registry

Tahera Diamond Corporation
130 Adelaide Street West,
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Attention: Greg Missal

Dear Mr. Missal,

Reference: NWB Letter 060517 NWB1JER0410 NWB Response to Site Water Management Plan-OTAE

AMEC Earth & Environmental, a division of AMEC Americas Limited (AMEC), is pleased to provide Tahera Diamond Corporation (Tahera) with our responses to the above-referenced information request from Nunavut Water Board (NWB).

1. There needs to be a full understanding and detailed discussion of the Site Water Management Facilities. Sizing details for all water containment and diversion infrastructure (drainage ditches, sumps, ponds etc.) and the final design and specifications of each has not been provided.

   Sizing details have been provided for constructed water management facilities. Detailed engineering design was provided to NWB prior to construction as required by the Jericho Water Licence. Conceptual designs were provided and thoroughly reviewed by the Board, its consultants, government agencies, KIA and other intervenors as part of both the NIRB project approval process and the water licence application process. Detailed engineering design will likewise be provided for other water management facilities prior to construction as required by the mine's water licence.

2. The Proponent states that "*maximum drawdown on Carat Lake is estimated to be 10.5 cm per year with no releases from the PKCA and under draught weather conditions*". The Board requests further information and detail into how this was calculated. If this calculation has been completed and submitted in another document the Proponent is invited to provide a detailed reference in where this may be found.

   From the Water Management Plan in the summary restates this finding which is the statement NWB is referring to:

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If, 24,000 m^3 of water per month is obtained from Carat Lake and the unlikely scenario of the use of reclaim water not feasible, the maximum draw down on Carat Lake is estimated to be 10.5 cm per year with no releases from the PKCA and under draught weather conditions.

The drawdown is simply the area of the lake divided by the water use which conservatively estimates that the water flowing into and out of Carat Lake would be equal in a dry year. Under normal flow regimes, as detailed in the Jericho application, the water in Carat Lake exchanges in approximately one year. Thus the drawdown estimate is conservative.

As required by the Jericho Water Licence, water levels in Carat Lake are monitored at the water intake.

3. Conceptual sizes and locations have only been provided for contingency ponds. Discussion should be provided into the specifics of these structures.

As required by the Water Licence, detailed engineering designs will be provided for contingency ponds at least 60 days prior to their construction, if ponds are required.

4. It is now understood that the East Sump replaces Pond C infrastructure. Water from the East Sump could be used for construction or road maintenance yet monitoring specifications and acceptable limits to release into the environment have not been stated. Monitoring and discharge specifications must be provided. Will CCME criteria be used as the marker? If not why not? Further discussion must be provided into which criteria is to be used and why.

Water from the East Sump is used in concrete and earthworks construction and is sprayed on roads to control dust and stays on the road, i.e., the volume of spray is not sufficient to create runoff. Further, all mine roads where water is sprayed, with the exception of the airport access road and ring road around the north side of the open pit lie within controlled drainage areas. CCME guidelines were developed to protect aquatic life. Water sprayed on mine service roads does not enter any water body and does not even enter adjacent tundra areas. CCME guidelines therefore do not apply.

5. Staged contingency structures are to be installed to maintain site water quantity and quality yet there has not been an established set of decision criteria presented that signals the need to install a contingency structure. The Proponent cross references the Waste Rock Management Plan Part 1 for monitoring plans and a mean of evaluating the need for a contingency structure. The Board requests a detailed reference within the Waste Rock Management Plan Part 1 that appropriately addresses monitoring to be completed that will signal the need to install SWMP contingency structures.

Decisions will be based on monitoring of quality and quantity of water managed by existing facilities as required by the Jericho Water Licence. Criteria for decisions will be trends in these measures indicating:

- *for quality, a decreasing trend in water quality that has the potential to affect discharge water quality from the PKCA based on calculation of dilution ratios (all*

water collection facilities ultimately report to the PKCA). This is referenced in Section 4.1 of the Waste Rock Management Plan, Part 1:

> Waste dump #1 will store primarily waste rock. The construction of the waste dump will start at contour elevations that allow any runoff to flow to the open pit and be handled by pit sumps. In the event that seepage water quality is low and quantity from waste dump site 1 is high enough, Pond A will be constructed.
>
> Waste dump #2 will store overburden and waste rock. Any drainage from the waste dump site 2 will initially flow to a sump in the open pit and subsequently to Pond B if significant quantities are encountered.

- *for quantity, peaks in containment or transfer requirements reach close to facility capacity. This is referenced in Section 7.4 of the Waste Rock Management Plan, Part 1:.*

> *To supplement the routine monitoring programs described in the Water Management Plan, an annual seepage survey will also be completed at the toe of each of the waste dumps. Although seepage is more likely to be detected on the down-gradient side of the piles, any areas close to the catchment boundaries will also be checked for seepage. As specified in Water Licence NWB1JER0410, the survey will be completed in July or August. Samples would be submitted for a comprehensive suite of test parameters, including pH, conductivity, ORP, temperature, major ions, acidity, alkalinity, metals and nutrients. Standard QA/QC procedures for water sampling including collection of field, travel and method blanks as well as duplicate samples will be included in the program.*
>
> *The results of the monitoring programs will be reported in an annual seepage and waste rock monitoring report.*

Changes in flow patterns caused by mine construction and operation may require additional water handling facilities, e.g. Ponds A and B.

6. As per INAC's Intervention at the Public Hearing and in conjunction with **Bullet e**. "*there is uncertainty with respect to potential effects of uranium leeching and possibly other metals such as copper. It is recommended that laboratory and field testing be conducted as soon as material is available*".

   SRK memorandum dated 20 April 2006 provides the requested information.

7. The Proponent states that a "*Runoff diversion is not required until such time that waste rock placement extends into the catchments of Lake C4*". A definition of the Lake C4 catchments should be included in the SWMP. When does the Proponent anticipate waste rock being placed in the catchments of Lake C4? Has placement occurred prior to the issuance of this letter?

   The catchment of Lake C4 is all area that drains toward Lake C4 per the contour maps included as Drawing WRMP – P1 -1 of the Waste Rock Management Plan, Part 1(attached for reference). The ditch may be required in the final years of mine life assuming the access road is built on the edge of the C4 catchment. Based on the Waste Rock Management Plan, Part 1, no waste rock will be placed in C4 catchment.

8. **(Section 2.3.2 – C4 Area Water Management)** The Proponent is to provide further detail into the specifics of proposed/completed construction that will barrier and divert

clean runoff water away from the rock dump and towards Lake C4. The Proponent conceptually identifies the upstream toe of the Waste Rock Dump and/or area access roads to be used. The Board requests information involving impact, potential impact, flow alterations of freshwater, and the deposition of waste related to the structures providing a diversion and barrier function.

Detailed engineering design will be provided at least 60 days prior to construction of the subject diversion structure should the need be required per Water Licence requirements.

9. **(Section 2.3.3 – Collector Ditches and Site Grading)** The Proponent is to provide further detail in this section. The Proponent indicates that areas will be graded and constructed to direct local runoff yet there is no detail or specification in how this will be achieved. The Proponent states that excavation cuts will be avoided to minimize potential impact to permafrost and erosion protection will be provided as required. No detail has been provided in how these will both be achieved. The Proponent is to provide a detailed account in how suspended sediments involved in ditch operation are to be managed.

Site grading of plant area ensures that runoff flows generally toward the PKCA or East Sump.

10. **(Section 2.4 – Collection Ponds A,B,C)** Criteria are not in place to determine and signal the need for a collection pond. The Proponent is to build further on how the ponds will accept and manage runoff. Further detail is needed detailing how water will move to and from these collection ponds.

Conceptual designs for ponds were provided in the Jericho Water Licence application (SRK Technical Memorandum W). Should the ponds be required, detailed engineering designs will be provided prior to construction per the Jericho Water Licence. The East Sump is a natural depression, not an engineered structure. Water level in the sump is monitored on a daily basis by mine staff when the sump is active to ensure the sump does not overflow and spill to the environment.

11. **(Section 2.5 – Pit Pond)** The report lacks detail and delineation in there and what pit sumps will be in place. The Proponent is to provide to the Board a detailed outline pit sump specifications and location.

The pit sump is a dynamic structure that moves with pit development. It is a collection pond in the bottom of the pit that collects runoff water. The pit sump is pumped to the East sump when required. Should the pond overflow all water would remain in the pit.

12. **(Section 2.7 – PKCA Facility)** What are the water quality limits for water reclaimed from the downstream side of the divider dyke? The Proponent states that water not used for reclaim will be discharged into Lake C3 on a seasonal basis to not exceed the hydraulic capacity of Stream C3. The Proponent should provide further detail into the specifics of seasonal basis (with respect to timing schedule and specifics) and provide a full understanding of the hydraulic capacity of Stream C3. Methods and procedure into how discharge is to take place are to also be provided.

Within reason, there are no water quality issues on reclaim water from the downstream side of the divider dyke, i.e., water is suitable for process use.

The specifics of seasonal discharge were provided to the Board in the Tahera Water Licence application, SRK Technical Memorandum W. The intent is not to exceed the hydraulic capacity of Stream C3 with PKCA discharge, i.e., freshet peak flows and if any erosion is present the ceasing of discharge. Based on detailed water balance calculations provided in the cited technical memorandum, flows under PKCA discharge will not exceed the 10-year flood levels of Stream C3. Long Lake dewatering flows were under this flow level and produced no signs of erosion. Water is pumped during the open water period July to November.

13. **(Section 2.7 – PKCA Facility)** The Proponent states that dam and pond water levels will minimize/eliminate water storage values to allow for cover. There has not been a satisfactory argument presented to the Board outlining water level conditions or the mechanisms and procedures in place to minimize/eliminate waters. The Proponent is to outline, in detail, water conditions with respect to temporal and spatial dimensioning of waters in the pond and dam structure and to provide procedures and mechanisms in place to minimize and eliminate waters in these structures.

Discussion of water management in the PKCA on closure can be found in the Reclamation and Closure Plan. The intent is to lower water back to natural levels at closure.

14. **(Section 2.8 – Fresh Water Intake)** The Proponent lists the use of clean coarse rock. The Board would like to point the Proponent to the September 1st, 2005 letter from DFO to the Proponent and the Letter from the NWB to the Proponent regarding the Freshwater Intake Causeway (April 24th, 2006). The Board requests that the Proponent appropriately quantify the terms coarse and clean or remove the reference from the document.

Coarse rock refers to broken, run-of-mine rock of variable size from 0.3 m down to 5 cm. Clean refers to the fact the rock was granite and is generally void of glacial till or overburden material.

15. **(Section 2.10 – Other Facilities)** The Proponent gives briefly mentions that culverts may be required. The Board requests full details on the location, specifications, and detailed delineation in where these culverts are to be installed. The Proponent also states that a culvert inspection and maintenance program will take place. The Board requests full details of this program and would like to know how and when the results from this program will be presented to the Board.

The Plan states:
The locations of any such crossings will be determined in the field and installations will be carried out in accordance with the appropriate Nunavut regulations and guidelines.

Culverts are required wherever there are draws that train water in the direction of roads, i.e., topographic lows. The size of culverts depends on the catchment area of the draws.

Full details of the program are monitoring of culverts and cleaning and maintenance as required. No formal maintenance and inspection program is contemplated.

16. **(Section 2.11 – Closure Considerations)** What criteria is in place for determining a '*significant flow*' that will be directed to the open pit? What criteria are in place to evaluate if the pit is filling at a faster rate then desirable? The Proponent states that "*Prior to filling of the open pit an in-pit water quality assessment will be conducted to determine the desirable fill rate and if required alternative methods of treatment*". The Board requests additional information fully detailing the program and would like to know how and when the results from this program will be presented to the Board. Why has the Proponent not provided a range of scenarios evaluating the water balance with respect to the various water sources and rates of water level rise in the pit (with appropriate calculations)? Does the Proponent agree that water quality should be assessed early in mine operation so contingency measures can be developed as soon as possible?

All flows from disturbed areas of the mine in the catchment area of the open pit will be directed to the pit. The pit will take more than 15 years to fill. Water quality in the pit sump is currently monitored under the mine's SNP and a significant database will be established prior to closure. Post closure monitoring will add to the database. Contingency plans in the early years of mining are premature because water quality may change with development of waste dumps and particularly with freeze back of the core of dumps. A conceptual plan was provided in the Water Licence application Abandonment and Restoration Plan and alternatives for treatment and discharge discussed. Without trends over time obtained from monitoring during mine operation and closure, it is not possible to meaningfully increase the detail of these discussions, i.e., to provide data that would assist adaptive management of mine water on closure.

17. **(Section 2.11 – Closure Considerations)** More detail is also needed regarding the particulars of flows from the pit meeting "*water quality acceptable for release*". What is this value? The Proponent states that "*flows from the pit could be directed into C1 stream or a separate open channel discharging along the East Shore of Carat Lake*".

The Water Licence application Abandonment and Reclamation Plan (Appendix A) makes the assumption that water would have to meet CCME guidelines at the time of pit overflow either at the overflow point, in which case water could be directed to Stream C1, or some distance (to be negotiated) out from the east shore of Carat Lake, in which case a channel separate from Stream C1 would have to be constructed.

18. **(Section 3.2 – SWB Estimated 2006 Water Balance)** The Proponent states that 120000 cubic meters of water has been removed from Long Lake and discharged to Lake C3 via Stream C3 during the 2005 season. The Board request full detail on how this undertaking took place. Long Lake dewatering was not authorized by the Board and there lacks an understanding in how the Proponent completed these activities.

As required by the mine Water Licence the discharge volume from dewatering of Long Lake was metered, producing the estimate of 120,000 m^3. The Long Lake Dewatering Plan provides the requested details including daily estimates of water released at the proposed discharge rate.

The mine Water Licence requires a dewatering plan be provided to NWB 60 days prior to discharge. In fact the plan was provided 149 days before dewatering took place. Long Lake water discharged was clean background quality water.

Dewatering commenced as per the submitted plan according the submitted schedule in the plan and was seasonally dependent. Daily monitoring, as required by the Water Licence was conducted. No erosion was evident during dewatering. A dewatering report has been submitted to the NWB.

19. **(Section 3.3 – SWB Discussion)** The Board requests discussion from the Proponent discussing the conservatively of the assumptions made in the Water Balance. The Proponent has stated that the Water Balance was based on a number of highly conservative assumptions. How can the Proponent effectively truly understand the system in place (including the water balance) if a number of structures are not in operation and the system is based on assumptions and adaptive design? The Proponent states that the processing rate may be altered. If this is the case would this alter the water balance? Appropriate discussion is required in examining how processing rate would alter the current water balance.

Details of the water balance can be found in SRK Technical Memorandum W submitted in support of the Jericho Water Licence application and reviewed by the Board and its consultants, government agencies and KIA prior to issue of the Licence.

The Water Management Plan states:

"Conservative" in this context implies assumptions that result in either higher volumes of runoff or in higher potential estimated contaminant concentrations. Actual conditions are, therefore, expected to be better than those presented herein. All water (runoff and seepage) from all site components was assumed to always be collected and directed to the PKCA for temporary storage until released from the system starting in the first year. Several of these components will not be constructed until further into the operational period.

The water balance assessment therefore overstates the amount of water that will report to the PKCA.

The Water Management Plan will require amendments as new water management structures are required or as experience suggests changes in how water is managed. This is a normal expectation of an operating mine where the landscape is continually evolving and water management requirements change.

Change in processing rate at the time of writing of the Water Management Plan was hypothetical. SRK Technical Memorandum W details how the volume of discharge water to the PKCA was calculated; processing plant production rate is the most significant factor in the PKCA water balance. An increase or decrease in processing production rate would necessitate a recalculation of the water balance for the PKCA, as would installation of additional water management facilities, such as Ponds A and B.

20. **(Section 3.3 – SWB Discussion)** The Proponent is to provide properly stated references and justification that detail effective wetting of rock surfaces in combination with freeze-back of permafrost will greatly reduce runoff amounts. Concentrations and quantities of water are dependent on this.

Waste rock from the pit at Jericho has virtually zero moisture content and much of the snow freezes into the material as it is covered. Water that percolates into the waste rock dump is frozen. The runoff coefficients used were conservative and experience at Jericho and other mines Canadian Arctic mines is that runoff is far less than predicted. The specific gravity of granite in situ is 2.8, whereas the estimated specific gravity of granite in the waste rock dump is 1.8 or approximately one third less; this information is provided in Waste Rock Management Plan, Part 1. The lowering of specific gravity is caused by void spaces which account for approximately one third of the volume of the dump (based on specific gravity comparison). Therefore that pore space will easily hold any precipitation that percolates into the dump.

21. **(Section 3.3 – SWB Discussion)** A full discussion on settling effectiveness of processed kimberlite is required. The Proponent indicates there is a planned efficiency for settling. What is this? Further detail on the decision making process to install an additional filtering dyke is required. The Proponent states that if specific water quality parameters become an issue during operation other treatment methods would have to be evaluated at that time. The Board would like further clarity into the limits being examined and compared against for water quality under this instance. The Board also requests further detail and specifications of the proposed alternative treatment methods.

Flocculent tests were run by Ciba Gigi for Tahera and these results were included in the Jericho Water Licence application (Appendix E). Flocculent is added in the process plant to improve water recovery. The Water Licence specifically forbids addition of flocculent in the PKCA. The settling rate of PK fines is irrelevant to PK management since suspended fines in the active cell are prevented from movement downstream by the filter dyke.

An additional filter dyke is required as the first cell becomes full limiting the effectiveness of Divider Dyke A. This is planned for either 2007 or 2008. Detailed construction plans will be submitted to the Water Board 60 days prior to construction.

Potential alternate treatment methods for PKCA water discussed in the Water Licence application included spray irrigation and addition of phosphorus to the PKCA.

22. **(Section 3.3 – SWB Discussion)** Does the Proponent agree that a bathometric survey would be an adequate tool in assessing settling efficiency and storage amounts over time? Would a bathometric survey prove useful in managing waters in the PKCA?

The bathymetry of Long Lake was determined pre-mining construction and thus the total volume available for PK deposition is known. The mine knows the deposition rate of PK from plant production and thus the length of time before the active cell will fill. The filter dyke presents a barrier against downstream transport of PK fines. Wind on the active cell, except under ice cover, will affect settling efficiency more than any other factor and can't be controlled.

23. **(Section 4.0 – Water Monitoring Requirements)** SNP station should be set up for the East Sump and along the Carat Lake shoreline downgradient from the waste rock sites.

Water is already sampled from the East Sump (SW8). Shallow water quality near the shore of Carat Lake will be influenced more by the quality of bottom sediment stirred up by wind and wave action than any other factor other than the average water quality of Carat Lake which is already sampled by WQ1 (freshwater intake) and the central basin of Carat Lake (WQ6).

We trust this information meets your requirements. Should you have any questions or concerns, please do not hesitate to contact me.

Yours truly,

Senior Associate

/bo
c. D. Johnson, Tahera Diamond Corporation