P.O. BOX 119
GJOA HAVEN, NU X0B 1J0
TEL: (867) 360-6338
FAX: (867) 360-6369

NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI

File: 2AM-JER0410/H3

October 11th, 2006

By Fax: 1-416-777-1898

Greg Missal
Vice-President Nunavut Affairs
Tahera Diamond Corporation
130 Adelaide Street West, Suite 1900
Toronto, Ontario M5H 3P5

Subject: NWB review of submitted TDC responses to Waste Rock Management Plan Part 2

Dear Mr. Missal:

The Nunavut Water Board (NWB) requests further clarity on issues related to the Jericho Diamond Mine Waste Rock Management Plan Part 2 (**Part H, Item 3**). The following documents were consulted in reviewing the Waste Rock Management Plan Part 2 (WRMP):

i. **Waste Rock Management Plan Part 2** *–Tahera Diamond Corporation - Jericho Project Waste Rock Management Plan Part 2: Kimberlite Ore, Coarse Processed Kimberlite and Recovery Circuit Rejects 1100060.004* (received: January 27th, 2006)

The NWB has retained the external expertise of Dr. Lee Barbour of University of Saskatchewan (U of S) to evaluate technical aspects of the presented design and evaluate any potential impact on freshwater. After a review of the above correspondence, it has been determined that further clarity is needed. The NWB would like to remind TDC that the technical document presented is to be a stand-alone document that effectively communicates particulars related to the technical aspects presented. Please find below Dr. Barbour's review of the Waste Rock Management Plan. Within Dr. Barbour's review, the NWB has included highlighted (yellow) bold text giving TDC direction in formulating a response and indicating additional information TDC is to provide.

1. The documents do not seem to provide a depth of understanding of the hydrology and hydrogeology of the site. A regional perspective of the hydrologic / hydrogeologic systems is not presented and the impact that the waste rock piles may have on these systems is not discussed in any detail. The actual watersheds likely to be affected are not clearly delineated on the maps and are not clearly linked to the various water courses or drainage pathways that appear to be present at the site.

   Drainage of the near surface coarse grained deposits adjacent to the pit, along with increased rates of net percolation within the coarse operational waste rock dumps, will change the watershed dynamics and the water balance within these watersheds.

   The Board requests a response to the reviewer's comments provided above. It may be appropriate to illustrate the delineation of the water drainage from the waste rock

piles on a site map. If this information has been provided in another document, the NWB invites TDC to appropriately reference where this information can be found.

Within Section 4.1 (General Layout of the Stockpiles) TDC stated that "ground survey methods will be used to accurately define the catchment limits prior to stockpile development". Will this information be provided in as-built construction records that will be submitted to the Board? If not where does TDC plan to report these findings?

Additionally, within Section 4.1, TDC stated that "PK stockpile at Area 4 may be amalgamated with Waste Rock Dump #2"; however, "this potential modification would not occur until later in the life of the mine". What criterion will be used to benchmark when this modification will be made? What implications does this modification have on the diversion/collection of waters from the piles and the design and operation of the PKCA? What implications does this have on pile design and stability? The NWB requests discussion and quantifiable markers used in the decision making.

2. The plan for control of surface and subsurface water flows appears to be reactive (i.e. collect seepage where apparent) and dependent on very flat topography with variable thicknesses of a permeable soil within the active zone. I would encourage the proponents to develop a more proactive stance on controlling surface and near surface water flows.

   The runoff events are likely to be dominated by snow melt and can be complicated by icing conditions associated with groundwater seepage, depths of snow accumulation, blockage of drainage paths by freezing, etc. I would be cautious of trusting all drainage control to very poorly defined surface topography.

   The Board requests detailed discussion to the reviewer's comments provided above. Additionally, detailed designs for the drainage ditches or water collection structures in the vicinity of the stockpiles have not been provided. This information was not provided in the SWMP. The Board requests additional detail and discussion on the proposed layout of the ditches, typical detail sections, or how the leachate will be collected and directed.

3. The footprint of the Waste Dump #1 seems quite peculiar and there doesn't seem to be a clear rationale for its layout.

   The Board requests a response to the reviewer's comments provided above. If this information has been provided in another document, the NWB invites TDC to appropriately reference where this information can be found.

4. The basic rationale of allowing for steeper slopes (i.e. a lower Factor of Safety) where the dump height is shallower at the upslope position must be based on the relative impact or risk of failure since it doesn't seem consistent with the types of failure that are considered critical. A planar slip in coarse grained soils is not likely to be strongly influenced by slope height. The use of cohesion in what appears to be relatively coarse grained soils is peculiar. I suspect it may be the result of an analyses artefact. Simulating shallow slips in granular material generally requires that one take into account the development of shear strength as a result of negative pore-water pressures, otherwise the shear plane wants to migrate right to surface. The use of a small 'cohesion' is one way to keep this from happening and allows more reasonable slip planes to be developed in the analyses. If this is what was done in the analyses then it might more reasonable to be explicit about this approach.

   The Board requests detailed discussion and description to address each of the reviewer's comments provided above.

5. The water balance within these piles is not reviewed or discussed. It would be interesting to read what the expected water balance is with respect to runoff, net infiltration or deep percolation. This should also be tied to some rationale for the water levels assumed within the stability analyses. The development of permafrost and freezing conditions, advancing from the surface and base of the pile will likely lead to quite complex controls on the development of mounding within the pile. That said, I don't believe the assumptions of the high water level to be non-conservative.

   The Board requests detailed discussion and necessary description to address each of the reviewer's comments provided above. TDC is invited to appropriately reference where additional information listed above may be found to assist in its discussion.

6. The use of benches is reasonable during placement of the waste rock pile; however, it is not clear as to whether runoff is expected and how the subsequent erosion and sediment release is being controlled. The use of outward tipping benches is likely better since this will likely lead to limited 'rilling' of the dump surface with small erosional gullies rather than producing large focused runoff locations. It is not clear as to whether the benches are inward or outward tipping. If they are inward tipping and runoff is focused then some control structures may be required to release this water without excessive erosion.

   The Board requests detailed discussion to the reviewer's comments provided above.

7. Both reports [WRMP parts 1 and 2] note that there is a separate report on final reclamation of these landscapes. However there are some issues of concern as to how waste rock dump design affects reclamation.

   First, the detail cross-sections suggest that clearing of organics is only planned for the area under the stabilizing starter berms. Obviously, this clearing is prudent in enhancing the geotechnical stability of these structures. However, I do not support covering the organic soil zone (and the associated weathered B horizon) with waste rock piles. These materials are not only thin and quite precious for reclamation; they also contain micro-organisms, seedbanks, and nutrients that are essential to reclamation efforts. They may not be practical or economic to reclaim but their value as reclamation material is very high and any loss of this material must be justified in my opinion.

   The reports due allude to a final vegetated landscape; however it is not clear in either document whether a basic materials balance for cover placement materials has been considered. I would suspect that the required materials (organic layer, and new 'B' horizon') for the proposed cover are in very short supply and some consideration should be made of leaving some of the waste rock piles as unvegetated 'barrens' so that the limited volumes of good material is strategically invested in a best end use.

   The Board appreciates the comments provided by the reviewer regarding reclamation. Although, reclamation plans will be provided in a separate document, as described above, the construction of the waste rock piles can impact the methods available for reclamation. Does TDC plan to recover the organic layer for use in reclamation? What value does the organic layer hold in? If TDC has addressed cover material in another report, the NWB requests an appropriate reference to the document.

8. Even in the absence of sulfides and the potential for 'acid mine drainage' it is important to recognize that simple weathering / flushing of the waste rock and kimberlite will produce leachate with elevated salt or metal loadings. This appears to be a bit more of a concern with the already weathered rock present in the Kimberlite pipes. The aggressive mechanical

weathering due to placement and the aggressive freeze/thaw weathering of the rock within the first few years is likely to increase the opportunity for release of these potential contaminants. The careful sampling of the prototype test pile should provide useful information in this regard.

The Board requests further detail and discussion on what information was obtained from the prototype test pile and how the test pile findings were incorporated into the design and operation of the waste rock piles described in this report. What was the objective of completing a prototype test pile? Where these objectives achieved?

The waste rock piles have been placed for more than one year and therefore have had time to potentially weather. Are the water quality test results completed to date consistent with what was assumed in the SWMP and PKCA management plan? What water quality constituents are elevated in concentration and what are measured values? Do the water quality results suggest aggressive freeze/thaw weathering of the rock?

9. There are some sections of the report that appear to be limited by the number of samples tested or that lack details of specific concentration ranges. It would be useful to have this information.

   The Board requests further detail and discussion to address the reviewer's comments provided above. How has a limited number of samples restricted/limited management and design? How many samples were tested and where were the monitoring locations? If TDC believes this information has been submitted in another document, the NWB invites TDC to appropriately reference the document and section where the information can be found.

10. The final 'release' pathway of all site waters (water and mass balance) with a definition of loadings to final receptor surface water bodies is lacking.

    The Board requests further detail and discussion to address the reviewer's comments provided above, in particular, what is the expected water volumes and critical water quality concentrations/mass loadings that are expected to be drained/diverted from each waste rock pile and a description of the methods used to characterized these values? This information has not been provided in the Site Water Management Plan (SWMP) or the Processed Kimberlite Containment Area (PKCA) Management Plan. If TDC believes that this information has been addressed in a response to the SWMP or PKCA reviews, the Board invites TDC to appropriate reference the document or letter and section where the information can be found.

Further to the comments listed above, the Board requests clarity on the following points:

11. Are the volumes and mass of stockpiled materials described in the WRMP part 2 reflective of an open pit mining operation instead of the open pit/underground mining operation that was assumed in WRMP part 1? If the open pit/underground mining operation was assumed in the report, what changes is design and operation of the waste rock piles and management plan are required?

12. (**Section 3.2.1 – Kimberlite Ore**) Reference was made to observations reported in the EIS regarding kimberlite weathering. The Board requests appropriate full referencing to this document including section number to where this information is located.

13. (**Section 3.3.1 – Sampling and Testing Programs**) Reference was made to geochemical characterization of the kimberlite ore and coarse PK as part of the EIS. The Board requests appropriate full referencing to this document including section number to where this information is located.

14. (**Section 4.1 – General Layout of the Stockpiles**) TDC stated that if geochemical testing and ongoing monitoring of the recovery circuit rejects demonstrates no long-term ARD and water quality issue associated with this material, deposition of the recovery circuit rejects may shift to one of the other coarse PK stockpiles". What specific testing and criteria will be used to assess long-term ARD potential and water quality issues? How will adding recovery circuit rejects to coarse PK stockpile impact design capacity, size, and stability? Which stockpile will the recovery circuit rejects be directed to?

15. (**Section 4.2.1 – Kimberlite Ore Stockpile**) Reference was made to permafrost conditions at the site and foundation conditions. The details of this information are not presented in the report. The Board requests appropriate full referencing to this document including section number to where this information is located.

16. (**Section 4.2.2 – Coarse PK Stockpile**) A small natural pond (East Sump) will be used as a water management control structure for the coarse PK drainage and plant area drainage. Is the capacity of the natural pond sufficient to contain drainage from stockpile and surrounding land and structures? Details of this volume balance were not provided in this report, SWMP, or the PKCA Management Plan. The Board requests additional detail and discussion to address this issue. If TDC believes this information has been submitted in another document, the NWB invites TDC to appropriately reference the document and section where the information can be found.

17. (**Section 4.2.4 – Recovery Circuit Rejects Stockpile**) TDC stated that the recovery circuit rejects will be stockpiled and the development will be discussed in the PKCA Management Plan. This information was not provided in the PKCA Management Plan. The PKCA Management Plan referenced the WRMP to contain this information. Crisscrossing references without providing the stated information is reporting mismanagement. TDC is required to fully communicate and address this issue through their written response to this letter.

18. (**Section 5.2 – Use of Coarse PK for Construction**) Reference was made to geochemical testing results of the coarse PK. The details of this information are not presented in the report. The Board requests appropriate full referencing to this document including section number to where this information is located.

19. The drawings provided in the report do not delineate hual roads used to develop the stockpile. The Board requests this information to be provided.

20. Pursuant to Schedule H.2.a. of the water licence **2AM-JER0410** (formerly NWB1JER0410), the [WRMP] "*shall be developed in accordance with the Department of Indian Affairs and Northern Development's (DIAND) "Guidelines for Acid Rock Drainage Protection in the North, September 1993" or subsequent editions"*. The Board requests additional detail and discussion on how the WRMP complies with these guidelines and to include reference to appropriate sections within the report and guidelines in the response. Are there any deviations from these guidelines in the WRMP?

21. Pursuant to Schedule H.2.d. of the water licence **2AM-JER0410** (formerly NWB1JER0410), the WRMP shall include "*a description of operational procedures that will be used to segregate and manage the rock that is identified for construction*". The Board requests

additional detail or direction to the appropriate reference document and section where this provision has been satisfied.

22. Pursuant to Schedule H.2.e. of the water licence **2AM-JER0410** (formerly NWB1JER0410), the WRMP shall include "*a description of the sampling design and analytical methods that will be used to support the operational classification of all rock types*". The Board requests additional detail or direction to the appropriate reference document and section where this provision has been satisfied.

23. The NWB requests all design drawings relevant to the WRMP be signed, stamped, and submitted to the Board.

In summary the Board requests a formal response to each of the above stated provisions. Sufficient detail and an avoidance of ambiguity should be followed in submitting response materials to the listed provisions. If you require assistance whatsoever please feel free to contact Dr. Jamie Van Gulck, P.Eng. at (204) 792-4129 or vangulck@vgqconsulting.com.

Sincerely,

Original signed by:

Joe Murdock
Director Technical Services

cc. Ramli Halim (Hatch-Acres)
Jamie Van Gulck (VGQ)
Lee Barbour (U of S)
Carl McLean (INAC)
Jim Rogers (INAC)
Peter Kusugak (INAC)
David Abernethy (INAC)
Geoff Clark (KIA)
Colette Spagnuolo (EC)
Tania Gordanier (DFO)
Mike Atkinson (GN-DOE)
Josh Gladstone (NIRB)
Kevin Buck (NIRB)
Cheryl Wray (TDC)
Bruce Ott (AMEC)