TAHERA
DIAMOND CORPORATION

25 October 2006

Chief Administrative Officer
Nunavut Water Board
P.O. Box 119
Gjoa Haven, Nunavut
X0B 1J0

RE: Response to Joe Murdock Technical Review

Licence: NWB1JER0410 Part H, Item 3 Waste Rock Management Plan Pt. 1

Appended to this letter is Tahera Diamond Corporation's response to Joe Murdock's Preliminary Technical Review that he provided to Bruce Ott of AMEC. AMEC did not prepare the document on our behalf and it was forwarded to us.

We have responded to the questions in the simplest format possible – by inserting comments within the text of the review provided. This provides context and easier access to the corresponding / support documentation or information requested.

References to the NWB Licence provided by Joe are in black, his comments are in blue and our responses are in green.

Should you have any questions with respect to Tahera Diamond Corporations response, do not hesitate to contact the undersigned.

Regards,

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V.P., Government and Regulatory Affairs
Tahera Diamond Corporation

Dan D. Johnson
V.P., Operations
Tahera Diamond Corporation

Nunavut Water Board
NOV 0 , 2006
Public Registry

061025 2AM-JER0410 Response to NWB WRM Plan Part1 - ILAE

PART H: CONDITIONS APPLYING TO WASTE MANAGEMENT PLANS

3. The Licensee shall submit to the Board for approval within four (4) months of the effective date of this license a Waste Rock Management Plan, to address the management of all rock this is disturbed, moved, stored, or otherwise affected by mining-related activity on the property over the term of the project. This Plan shall be developed in accordance with Schedule H, Item 2.

Schedule H - Conditions Applying to Waste Management Plans

2. The detailed Waste Rock Management Plan referred to in Part H, Item 3 of the Licence, shall include but not necessarily limited to the following:

a. the Plan shall be developed in accordance with the Department of Indian Affairs and Northern Development's (DIAND) "Guidelines for Acid Rock Drainage Prediction in the North, September 1993" or subsequent editions.

The Board requests that Tahera briefly outlines how the *Guidelines for Acid Rock Drainage Prediction in the North* (Sept 1993) were consulted in preparation of the Waste Rock Management Plan. The Board requests well developed statements within the body of the text that clearly references where the *Guideline* was used. These references set within the WRMP should point the reader to the appropriate section within the *Guideline* where the *Guideline* was consulted.

The waste rock management plan was prepared with DIAND Guidelines where applicable. Tahera's consultant determined that the waste rock was not acid-generating and therefore the *Guidelines* did not apply to the WRMP. In the original submission to the Nunavut Water Board, (Appendix T SRK Tech Memo M Waste Rock Management), Tahera's consultant clearly identified on page ii of the Executive Summary that:

> The waste rock will be comprised of granite, granodiorite and some diabase. The waste rock will be extremely competent and strong. Geochemical testing indicated there are relatively few concerns with respect to ARD and metal leaching from the waste rock.

The geochemical study was discussed in more detail:

3.3 Geochemical Characterization

3.3.1 Sampling and Testing Programs

Detailed geochemical characterization of the waste rock, kimberlite ore, and coarse PK was completed as part of the EIS. The programs included detailed core logging, examination of the development rock, mineralogical characterization, acid base accounting (ABA), solids ICP, leach extraction tests, seepage sampling, and supernatant characterization. Details of the sampling and testing programs were presented in Appendices D.1.3 through D.1.6 of the EIS (Tahera 2003), and Technical Memorandum H of the supplemental EIS submission (SRK 2003d). The following sections summarize key findings of these programs.

The key observation is that the rock is non-acid generating.

ABA testing on eighteen granite and granodiorite samples (EIS Appendix D.1.3), including one sample that was altered and iron stained (Technical Memorandum F), and total sulphur tests on thirty samples (EIS Appendix D.1.3), indicated that these samples were non-acid generating with SRK also observed that Jericho is further north than Ekati Diamond Mine and that conditions experienced by Ekati would be even more favourable at our site for the development of super-cooled waste dumps and thus minimal groundwater seepage (Section 2.6, page 7).

Seepage monitoring on the tundra adjacent to the Panda/Koala Waste Rock Storage Area (WRSA) has indicated there is relatively little flow from the dumps, likely due to freezing of infiltrating water. Samples from nearby reference sites indicate pH's in surface waters unaffected by mining ranged from less than 4 to greater than 7, reflecting organic acids from the tundra soils. Samples down gradient of the waste rock piles showed varying degrees of effects from leaching of the mine rock, with a similar range of pH's as in the reference sites, trace to moderate concentrations of major ions, and generally low metal and ammonia concentrations. The Ekati seepage data was used in conjunction with extraction test data from Jericho to develop source concentrations for the waste rock at Jericho (Technical Memorandum I, SRK 2003c).

b. this Plan shall describe decision criteria and operating procedures of how all rock will be placed and managed during construction, mining and post closure.

In **Section 4.3.1** (Page 17) the Proponent outlines that that dump lift thickness will depend on the projected height of the structure and number of benches. At the final stages of design should not there be a firm understanding on how the lift piles will be specified?

As stated, the planned lift thickness is 10m in height. Tahera has intentionally left leeway to accommodate situations that require alternative actions. A normal operating condition would be topographic elevation differences.

If the top of the dump were to be only 5m above topography in a specific area then it is clear that operations would have a thinner lift. Similarly the original ground is not flat requiring a varied thickness of the dump bench until level benches are established. If in the unlikelihood that geochemical monitoring were to encounter a rock type or zone that

does appear to have a tendency to be acid-generating, then it would be prudent to consider encapsulating the material in a fashion similar to what BHP did to the meta-sedimentary rock at the Misery pit. In that case a 10m lift was covered by 5m of granite. To date geochemical monitoring of waste rock from Jericho pit has not indicated any presence of acid generating waste rock materials.

In **Section 4.3.1** (Page 17) the Proponent states that the slopes between benches will transform and correspond to the angle of repose of the dump material. This is further complimented in *Drawing WRMP-P1-3 Detail 1* yet the Proponent does not provide detail into how this will be achieved. Furthermore in Section 4.4.5 (Page 19) the Proponent indicates that a post-closure downstream slope of 3H:1V would exist as assumed. The Proponent is advised to build further on this assumption and how this will be achieved (i.e. what methods?).

The assumed final angle of repose for the dumps (2.6:1 or 21°) would be achieved by modifying the bench width to maintain the overall slope. For example, it would take the 35° angle of repose on a 10m lift plus a proposed catch-bench width of 15m to achieve the final crest-to-crest angle (21°). If the lift thickness were to vary, as described above, then the designed catch-bench angle would be modified to maintain the correct final design slope. On an operational basis consideration could also be given to utilizing a Cat bulldozer to flatten the slope if it were to be needed.

As per **Section 4.4.5** (Page 19) the Proponent details that the dump height was taken as 40 m yet there is conflict in the report. The waste rock dump height has yet to be fully defined (**Section 4.3.1** Page 17). Does the Proponent feel that the analysis presented represents actuality if uncertainty still remains in design specifications? The Proponent is to build further, with engineering judgment and discussion, on the appropriateness of each Geometry and Input Parameter assumption made in **Section 4.4.5**. The Proponent is to also clearly state the level of confidence in the assumptions stated with respect to actuality. The Board would like to also understand why analysis was not presented for Waste Rock Dump #2.

While it is true there is always uncertainty in the size of a mine and related waste dump, SRK used their best judgment in determining a probable scenario at closure. Changing economics, updated slope stability information or safety determinations or other circumstances out of our control can all affect how steep a pit wall will be and thus how much waste would be stored in the waste dump.

Since nothing has changed since the original submission to the Board, the determinations described in SRK document Technical Memorandum A – Supplemental Geotechnical Data (1CT004_04_TM-A_GeotechnicalData_srk_20031002.pdf) has relevance to the current WRMP submitted.

Tahera Diamond Corporation is confident of the professional ability and engineering judgment of SRK Engineering Consultants staff that conducted the design work. Tahera also has some in-house professionals that worked at Ekati Diamond Mine and it is their opinion that input parameters were appropriate and likely very conservative.

The SRK analysis looked at the dump area with the highest slopes as the worst case scenario area to conduct the slope stability analysis. With respect to the lack of an

analysis for Waste Dump #2,the height of the dump was below that planned for Waste Dump #1 and as such represented a more stable scenario (i.e. conditions more stable than analysis for Dump#1 would indicate).

The Board would like further detail pertaining what provisions are in place if frozen berms are developed at the toes of waste rock piles to promote in-freezing of water within the dump of each dump stage as suggested by the Proponent (**Section 5.3.1** Page 23)

The development of frozen berms **may** happen. If these berms are constructed they will be of till material will be place inside the toes of the waste rock piles. The overburden till material has reduced open area spaces as compared to Run-of mine granite waste rock and will create a block against water percolating down into the dump promoting in-freezing of water. For berms to remain frozen, they will have a minimum waste rock cover of 5m and be placed at a distance of no less than 5m from the toe berm. Given the current geochemical information it is not considered to be likely that frozen toe berms would be developed.

The Proponent is to provide additional detailed information on how the surface of the dump will be inclined to direct runoff water off the dump toward the open pit or collection ponds (**Section 5.3.1** Page 23)

Site surveyors lay out grade control stakes for all construction purposes. The same controls would be in place to gently slope the top surface of the dump towards the pit or collection ponds.

C. an annual schedule for ore stockpiling, processed kimberlite generation and waste rock production by rock type, tonnage, and destination over the term of the project including sources and volumes of each rock type;

The Board requests the Proponent to clearly reference within the WRMP how this provision was entirely satisfied in the submission. This should be done through properly referencing and cross referencing within text (materials where the Proponent believes the WRMP addresses all aspects of this provision) to ensure this provision has been addressed adequately in the WRMP.

In terms of an annual schedule for ore stockpiling, processed kimberlite generation and waste rock production etc please refer to the following:
Ore stockpiling is a dynamic pile to the east of the process plant and is limited to about 10 days supply (20,000 tonnes) to accommodate adverse weather or pit production disruptions. Such a small, active stockpile cannot be adequately scheduled.
Processed kimberlite production is the nominal 2,000 tonnes per day and the associated waste from that process is discussed in the PKCA Waste Management Plan and was not intended to be included in the discussion of the pit waste rock production (granite, granodiorite, overburden and diabase).

Table 2.2 shows the life of mine estimated waste rock production and Figure 2.1 shows the schedule for its destination. Tahera feels that it is clear that overburden, which may have some value for reclamation, be easily accessible and thus it is all destined for Waste Dump #2. Waste Dump #1 is intended for the bulk of the rock – with consideration given to some infrastructure construction needs. This is clearly stated on page 16,

Section 4.1 General Layout. The pit is the source of all the rock discussed. Estimated quantities of waste rock, based on the current mine plan, were provided in Table 3.1 of the Waste Rock Management Plan – Part 1.

As per **Table 3.1** (Page 13) the Board requests further information into how approximate quantities and estimated density were determined. What characteristics were assumed? Further more the Proponent states within **Section 3.2.2** that the density range is 1.6-1.9t/m^3 whereas its estimated density in **Table 3.1** is 1.7t/m^3. Additional information must be provided.

The approximate quantities and estimated densities were based on geological solids modeling for the various rock types. The solids modeling utilizes in situ densities quantified by lab testing. Once the material has been drilled and blasted, experience produces average swell factors and a lighter density per cubic meter for broken waste rock commonly known as 'bulk loose density". When the material is placed in a dump there is a certain amount of re-packing resulting in a higher packed density. All of this information is compiled and it results in the "estimated" density of the waste rock pile.

The situation is similar for the overburden dump which would also have some rock mixed in along with variable moisture contents of the sands and silts. The rock component comes from three sources: original cobbles or boulders, admixture along the contact zones and by intentionally addition to stabilize soft zones in the dump. The variation described in Section 3.2.2 reflects the reality of the source material and our best estimate of the final compacted, placed density.

These density estimates are then used to calculate volume estimates of dumps and as such degrees of accuracy needs to be considered.

d. a description of operational procedures that will be used to segregate and manage the rock that is identified for construction;

Under the **Control Measures during Construction and Operation Section** (Page iii) the Proponent states "*The contact between the overburden till waste rock and the rock is easily discernable to operations personnel and samples will be taken regularly during the construction phase to verify the waste rock characteristics*". The Board requires the Proponent to define what procedures are in place to differentiate rock type and define sample frequency and issues pertaining to how sampling location is selected. The Proponent is advised to review **Section 5.2** (Page 22) and fully delineate how rock will be placed (for construction and not for construction purposes). The Proponent is also advised to clear up ambiguity with the statement "*If visible sulphides or mixed kimberlite and granitic rock are observed, the rock will be placed in a designated area in the centre of the waste rock pile...*"

The sampling of construction rock was a minimum one per blast and the results supported the original SRK determination that the materials were non-acid generating. The samples were random "grab" samples from the muck pile or composites of drill cuttings and were intended to give a reasonable representation of the overall geochemical characteristics. To date no, acid generating material has been encountered. Similarly, granite rock was identified for construction and was place by the appropriate method for each construction task (e.g. for bulk fill it was dumped and spread by dozers;

for engineering fills crushed material was utilized and spread and compacted to specifications).

The ambiguity of the statement is not clear to this writer. What Tahera meant is that if the muck pile was clearly mixed kimberlite and granite then it would be put into the waste dump and not used for construction. Note that if the proportion of kimberlite was significant, then it would be temporarily stored for later processing in the plant.

If the muck pile had an obvious high sulphide content in the granite (or granodiorite or diabase) then it too would be put into the center of the waste dump. In both situations the aggradation of permafrost into the dump and/or encapsulation of the material would mitigate possible acid rock generation.

Within **Section 5.2** (Page 22) the Proponent states that geochemical testing indicates that the waste rock is non acid generating. The Board advises the Proponent to provide or properly reference the analysis and qualified statements indicating that this is the case. This point should be partnered with the second point in part f., brought up by the Board, in this document (see below). The Proponent should also provide proper reference to what the physical specifications are that the Proponent is planning to abide by.

The initial sampling was performed by SRK Engineering Consultants and was not reintroduced in this document. Inclusion was considered to be an unnecessary repetition since the Board already has the information. Rock is tested as part of the monitoring program.

e. a description of the sampling design and analytical methods that will be used to support the operational classification of all rock types;

As per **Section 3.2** (Page 13), physical characterization of waste dump materials has been determined through other materials not referenced or provided within the document. The Board requests the materials stated be referenced or provided. Also the Proponent states that incremental information will be provided as time progresses. The Board requests further information into how this additional information will be provided to the Board.

The documents previously provided are:

Characterization of Jericho Waste Rock, SRK February 2000
Geochemical Characterization of Kimberlite Ore, SRK January 2000
Technical Memorandum D, Supplemental Information on Waste Dumps and Stockpiles, SRK October 2003
SRK Technical Memorandum M Waste Rock, Overburden, Low Grade Ore and Processed Kimberlite Management Plan, SRK August 2004
Incremental Information is reported by the Site Environmental Staff to the appropriate regulatory agencies. Reporting timelines vary but are generally monthly and always annually.

Within **Section 3.2.1** and **Section 3.2.2** (Page 13) the Proponent references "*Available data*". The Proponent is requested to provide proper referencing to this material.

Technical Memorandum A – Supplemental Geotechnical Data, SRK, October 2003

In **Section 3.3.1** (Page 14) the Proponent states that materials were part of the EIS. The Board advises the Proponent to properly reference the EIS (Document title, Section, Page) where these materials may be found.

Technical Memorandum A – Supplemental Geotechnical Data, SRK, October 2003

The Board requests the Proponent to provide clarity to the following issues contained within **Section 7.2** (page 25):

i. The term 'minimal variability' must be built upon
ii. How will sampling amounts be determined for each rock type?
iii. How will **all** the information presented in Section 7.2 be presented to the Board including the reporting of the pit wall evaluation?

i) Minimal variability – it is assumed that the craton host rock has a heterogeneous nature and that the variability of sample analyses seen within the pit will be very close to sampling error. Such consistency in analyses would dictate that the sampling frequency could be lengthened.

ii) Sampling amounts are typically a random "grab sample" of about 25kgs from a freshly blasted muck pile. The samples may also use drill cuttings composites.

iii) Annual reporting is required by WCB Mine Safety Division. The report is due by the end of March and contains the following criteria.

1.04. The mine design shall consist of drawings, plans, calculations, specifications and written descriptions and shall

(a) describe the geology of the mine;
(b) outline the geometry of existing excavations, if any, and proposed excavations;
(c) provide the rock mass characteristics that are representative of the ore, footwall and hanging wall rock that will be encountered most frequently and identify the orientation of the most common joint sets;
(d) describe the hydrological features that may affect the working of the mine;
(e) describe previous occurrences of ground instability and include recommendations from reports of investigations;
(f) describe, for surface mines, expected climate conditions, the presence of permafrost, if any, and average monthly precipitation;
(g) describe the mining method including bench or stope sequencing and blasting methods;
(h) specify ground support systems, including pillars, backfill, timber support, tendon support and any other type of support, the criteria used concerning their selection, dimension, spacing and extent;
(i) describe measures used and planned to assess potential ground instability;
(j) include specific precautions to be taken concerning parts of the mine where bodies of water, overburden, tailings, gas, low oxygen or water soaked material may inrush or flood the workings; and
(k) include such other information as the chief inspector may require.

1.05. The mine design shall be assessed and updated by an authorized person annually and before any major change is made to the mining method or the equipment used.

A copy of the report can be modified to suit the NWB and submitted at the same time. An interim evaluation was done by Piteau Associates in September 2005 and a copy is

included.

How does the Proponent plan to report the information to be gathered as part of **Section 7.3** (Page 26)? The Board requests the Proponent to provide further detail and discussion into how daily inspections and reporting of these inspections to the Board will take place (**Section 7.4** Page 26).

During the initial stripping of the pit, observations by an EBA field engineer and other Tahera staff were that the overburden had approximately 30% or less entrained ice - with no visible massive ice present. These were visual best estimates and are not dissimilar to results found during test drilling. This is assumed to be active layer water and the quantities encountered reported to the pit sump and are directed to the east sump and PKCA. Pit dewatering quantities are reported to the NWB on a monthly basis. Should any significant quantities of ground ice be encountered these observations and resulting water quality analysis would be reported to the NWB as part on the monthly report.

f. a description of the methods that will be used to construct till storage, ore stockpiling, Processed Kimberlite, and waste rock facilities such that generation of acidic drainage and/or metal leaching is limited;

Page ii in the WRMP report lists that "*Geochemical testing indicated there are minimal concerns with respect to ARD and metal leaching from the waste rock.*" This claim must be backed up. Is this material from another document or is it supported in this document? If so the Proponent should elaborate.

See earlier references within this response.

The Board would like to better understand the condition of the waste rock to be stockpiled. Is it in the opinion of SRK and the environmental geochemist that the waste rock to be piled will not be at acid generating risk? (**Section 3.3.2**). Could the Proponent/Consultant evaluate the level of confidence with respect to the sampling program used in determining these conclusions?

Tahera has a very high level of confidence in the predictions of SRK since much of the work also includes experience in similar rock at other mining properties. This is well documented in the references provided. Notwithstanding this high confidence level, waste rock samples are regularly collected and tested for presence of sulphides.

In **Section 3.3.2** (Page 14) the Proponents reports that "*ABA testing on eighteen granite and granodiorite samples including one sample that was altered and iron stained and total sulphur tests on thirty samples indicated that these samples were non-acid generating with low neutralization potential (NP's from 2 to 21 mg $CaCO_3$/t) and negligible levels of sulphides (average <0.01%S)*". The Proponent is advised to assess this conclusion with respect to determining how samples taken (with respect to frequency per spatial dimensioning) best represent waste rock conditions for the entire site. The Proponent/Consultant is to state the limitations of the quoted assessment with respect to this project.

The conclusion is in respect to the samples taken and analyzed. The final sentence in the referenced section indicates that: "the waste rock solids will be monitored during mining to ensure that any isolated materials that could require special handling are appropriately identified and managed during mining." A program of sampling of waste rock and kimberlite for ABA and metals was developed and proposed to the Board as part of the hearing process. The program of weekly sampling of waste rock and biweekly sampling of kimberlite ensures potentially acid generating rock will be identified and segregated. To date no potentially acid generating waste rock has been encountered, as predicted by initial testing for the project environmental impact statement.

Could the Proponent define, in quantifiable terms, the term '*generally low*' with respect to dissolved metal concentrations in **Section 3.3.2** (Page 14)? The Proponent references periodic samples with respect to the "*development waste pile*". The Board advises in annexing the material or properly referencing where sampling results may be found.

The term "generally low" in that context refers to being below CCME guidelines with exception of copper. The details of the geochemistry of the waste rock was described in the submittal Technical Memorandum H – Supplemental Geochemistry, SRK October 2003.

In **Section 3.3.2** (Page 15) the Proponent states that "*Extraction tests indicate that enhanced leaching of uranium from the granitic rocks was due to mixing of the granatic rocks with kimberlite. Therefore, any waste rock that is inadvertently mixed with kimberlite should be segregated and placed into a designated area in the centre of the waste dump to promote freezing*". The Board seeks detailed documentation clearly indicating how this will be achieved. Furthermore the statement references extraction tests. The Proponent is to include these results and analysis to back up the conclusions and claims submitted. If the material is found within another submitted document to the NWB, the Board advises the Proponent to properly reference where these materials can be found. Also the Board would like full detail into how the Proponent plans segregate materials.

Discussion of the testing and results are in the documents already referenced. Some other comparisons have been made and are described in Technical Memorandum I – Estimates of Source Concentrations, SRK October 2003. Waste rock that has kimberlite mixed with it would be dumped in the center of dumps encapsulating the material. This is done by avoiding the placement of any such material on the outer edges of any dump face.

The Proponent makes claim that sampling will take place on a weekly basis to confirm rock geochemistry expectations (**Section 5.2** Page 22). The Board would like further information into how this information is to be presented to the Board and what testing requirements and protocols are in place.

This information is present in the annual monitoring report and protocols have been established for testing. These protocols were developed by mine staff in consultation with SRK and were included in the Waste Rock Management Plan, Part 1, Section 4.0. A composite sample of drill cuttings from each blast round are collected weekly prior to charging the holes. Composites are draw from across the drill area to be representative and sent to ALS for metals and ABA analyses as indicated in Section 4.0 of the Waste

Rock Management Plan.

Data are presented in monthly SNP reports and in the annual report to the Board.

On Page 15 (**Section 3.3.2**) the Proponent pledges that "*the waste rock solids will be monitored during mining to ensure that any isolated materials that could require special handling are appropriately identified and managed during mining*". This statement is regarded as ambiguous. The Proponent is advised to provide sufficient detail into the particulars within this statement.

If the geochemical testing program identifies materials that need special handling, they will be identified (survey stakes and flagging) so that the equipment operators can visually see what material needs to be isolated. Similarly such materials would be directed to a specific area in the active dump to ensure they are not within 10 meters of the final expected dump face.

In **Section 3.3.3** (Page 15) the Proponent lists the fact that three (3) samples were collected for settling tests. The Board requests further information qualifying the protocol in place to adequately represent site conditions. How were overburden sample locations selected? Is the number and location of samples taken adequate with respect to the size, location, and content of the site? The Board also requests the results and analysis of all tests on these samples. This will quantify the Proponent statement "*The results indicated generally low dissolved metal concentrations*".

The overburden samples were collect from the waste rock pile from the development of the bulk sample decline. The overburden sites were selected from three different areas of the overburden material from the waste rock pile and represent the overburden section from the development decline. The results can be found in SRK Technical Memorandum I, Table I7, October 2003 EIS supplemental documents submitted to NIRB by Tahera as Appendix I; the subject table is attached to this document. Overburden in the pit area which was targeted for removal was delimited from geotechnical drilling by SRK and Bruce Geotechnical and from visual inspection. Overburden (found to be mixed with a predominant till mixture when removal was actually undertaken) is stored in a controlled drainage area which drains to the pit, or where runoff can be pumped to the pit. Through seepage monitoring (required in the Water Licence) any drainage from the till dump will be characterized through sampling as mining proceeds and reported to the Board as required in the Water Licence.

The statement of "generally low" means below CCME guidelines with exception of two metals indicated.

In **Section 4.1** (Page 16) there is discussion about the construction of Pond A and Pond B if significant quantities of seepage is encountered. Additional information and specifics are required to be presented. The Proponent is advised to define the limits in where these Pond facilities are needed with respect to quantities and other flow characteristics. Also, the Proponent is required to detail the mechanisms, functions, and designs associated with these facilities.

The road network and lay of the land indicate that most seeps would report to the pit

sump. If seeps occur, and they are of unacceptable water quality, the flow rates and quantities would have to be assessed to determine if a ditch or deflection berm would be adequate to direct the flows to the pit. If the criteria indicate that either of Sumps A or B are needed, then the design prepared by SRK would be reviewed to determine the size of sump needed to mitigate the problem.

Sump B is not required as any seepage from this area would flow into the pit. The requirement for sump A will depend on measured flow quantities from the initial dumps during a period in which dump runoff reports to the open pit. In 2006, there has been no measurable runoff from the dumps flowing into the pit.

Since the discussion of seeps is a "hypothetical" situation, defined details on the mechanisms, functions and designs is not relevant at this stage. All earthwork structures associated with water or waste detainment will be designed by an appropriate and qualified design engineer and submitted to the NWB prior to construction.

The Proponent is required to clear up uncertainty within "*There is flexibility to increase the height and/or merge the dumps to provide additional capacity should mine plans be altered during the first year of operation.*" (**Section 4.1** Page 16) What is meant by 'flexibility' and 'altered' with respect to engineering judgment? The Board advises in providing detailed scientific documentation to assist in clearing the ambiguity.

The terms "flexibility" and "altered" do not apply to engineering judgment. The context was intended to mean that within the known parameters of the waste rock material (e.g. angle of repose; compaction) could allow the waste dump design to be modified.

The Proponent outlines in **Section 4.3.1** (Page 17) that the dump designs are based on the properties of dump materials and the foundation conditions yet further detail is needed. The Proponent also states that dump capacity can be increased through design modifications? What modifications are proposed?

At this stage no modifications are proposed since there are still some unknowns regarding pit wall stability at depth. If the wall stability proves to be as good as we currently believe, then we can limit pit width yet achieve greater depth. The greater depth would give us more kimberlite without dramatically increasing the associated waste stripping.

Modifications that could be considered would be to increase the height of the dump, or increasing the footprint. Another thing being looked at is the use of an in pit waste dump. At this stage these are hypothetical situations and would be addressed by a supplementary submittal to the Board prior to construction.

As described in **Section 4.3.3** (Page 18) "*Some portion of the overburden stockpile may thaw during the summer months and may require confinement at the dump perimeter*". As a result the Proponent is proposing a waste rock buttress for the downstream slope of Waste Dump Site 2. The Board requests detailed discussion and design of the proposed waste rock buttress.

The overburden material stripped off is "buttressed" by the haul road. The buttress is essentially granite run-of-mine that has a steeper angle of repose than overburden. As

the overburden dump is raised, the downstream face (which is above the haul road) would be armored with run of mine granite to ensure that possibly sloppy mud doesn't run out onto the road.

In **Section 4.3.3** (Page 18) the Proponent states "*The performance of the overburden will be evaluated following the first summer of operations, and if conditions warrant, the slopes on the upstream side may be optimized*". This statement is ambiguous. The Proponent is to provide detail and clarity with the particulars stated in this statement. What entails '*performance*'? What is meant by '*evaluated*'? What '*conditions*' would open the '*optimization*' of the upstream side? The Proponent is also asked to scientifically define what the term 'optimize' means as stated in the last paragraph of **Section 4.4.7**.

The intent of the statement was to point out that if the overburden is "drier" than estimated, then it would not be subject to thaw and melt out. We have observed that the overburden faces are standing steeper than the conservative angles suggested by some consultants. In addition, the core of the overburden dump has frozen or remains frozen and only the active areas on the outside edges have seasonal melting. There has been no measurable seepage from the dump migrating through the buttress/haul road, supporting the assumption made. On the upstream side of the dump, optimization may include final slope criteria and cover requirement that will be recovered to provide long term stability for the dump.

The results of the summer evaluation indicate to us that the conditions expected do not exist and that the performance is better than predicted. This will allow our designers to optimize the shape of the dump to accommodate the volumes of overburden encountered. The estimates of overburden were also determined on somewhat limited data and as we mine more of the pit we have actually seen less overburden in many areas. The optimization of the design could be beneficial by limiting the footprint, but this still remains to be fully quantified.

The Proponent states in **Section 7.6** (Page 27) that thermal monitoring is not critical to the performance of the waste dumps yet throughout the report the Proponent outlines the need to place a waste rock-kimberlite conglomerate in the center of the waste rock dump to promote freezing. Furthermore, as identified in **Section 4.3.3** (Page 18), there may be a requirement for a waste rock buttress at the downstream slope of Waste Dump #2. There is also detailing indicating that thaw may require the waste rock buttress. The Proponent is advised to refine Section 7.6 to reflect these provisions and indicate, with detail, what is in place with respect to spatial and temporal dimensions of a thermal sampling program.

As stated, thermal monitoring is not critical to the performance of the waste dumps. The toe buttress suggested for Waste Dump #2 is not to promote freezing or prevent thawing, it is simple intended to ensure that muddy overburden doesn't slump causing stability problems along the dump face.

The idea of placing waste rock kimberlite mixtures in the center of the dump is intended to mitigate any kimberlite-tundra interactions that may cause ARD conditions. The granite can act as an insulator as well as a barrier.

General Comments

The Board would like to acknowledge that the requirements of the *Waste Rock Management Plan* set forth in Water Licence NWB1JER0410 include kimberlite, coarse processed kimberlite, and fine processed kimberlite. As identified by the Proponent on page *i*, a Part 2 is to be issued sub sequential to this Plan whereas detailed management plans for the fine PK will be provided in the PKCA Management Plan. In essence this report will not fully satisfy the requirements of Part H Item 3 and Schedule H2 without this submission. As per the issued licence the PCKA Management Plan would also then have to be submitted four months after issuance of the licence (Part H, Item 3).

See the January 18, 2006 Waste Rock Management Plan – Part II provided to Tahera by SRK.

Operating procedures and the general conditions of the WRMP are dependent on mine economics. Could the proponent please provide detailed discussion on this relationship to how operating procedures will be affected under the differing potential operating regimes?

The early closure of the Winter Road and impact on our supplies is a prime example of Tahera's need to describe operating procedures and conditions in general terms. Events such as the early closure are beyond our control and the mine plans we had in place for 2006 are no longer possible. We have to reassess how to balance ore supply to the plant along with the construction of the waste dumps and the timing of the construction. Currently we believe that we will only be able to mine about 7 million tonnes of waste material. Some of it will go to completion of the infrastructure (e.g. dams, shoals, lay-downs, roads, blast hole stemming) and some will go to the dumps. Not as much overburden will be mined as we will be forced to increase the depth of the starter pit to achieve ore release. Overall this has little impact on the overall dump design but will result in less tones being place in 2006 and more waste rock tones being placed in 2007 than originally planned.

Operating under these dynamics would call for the Proponent to outline conditions under the differing scenarios? How will further information be presented to the Board once a scenario is adopted? How does the proponent suggest on reporting changes in operation?

The scenarios all fall within the norms of the mining experience and Tahera would suggest that the annual report to WCB and the NWB should be adequate.

As indicated in **Section 2.4** (Page 11) "*Should further analysis dictate that underground mining is the preferable method for later years of the mine life the OP/UG transition would start at the level determined by the economic trade-off studies and actual mining costs experienced during the first years of operations*". Surely waste is a function of these decisions.

Waste is generally not as significant as one may think. The high value per tonne of the kimberlite can sustain quite high stripping ratios. The most likely reason for going underground would be the lack of mining width for the open pit equipment. The bottom of the pit is too small for a loader and trucks. At that stage the switchover to UG is realistic. Given the fact that we have zones of "inferred resource" as defined under National Instrument 43 101, we cannot make a determination of the transition point until the resource is reclassified to reserve status.

Further specifics are needed. Due to the dynamic of the waste rock-overburden generated volumes it is essential to employ calculations that embody all potential scenarios with respect to

waste rock. This will communicate to the Board that contingency is set in place. Has the OP/UG Plan been addressed to the Board in another document? If so the Proponent is advised to provide a clear proper reference. If the material is not contained within another document the Proponent is advised to annex materials to this document as dump designs are based on the OP/UG quantities.

Based on current reserves information, as indicated in the previous paragraph, underground mining is a realistic expectation at this time. If further data collected as part of deposit characterization drilling indicate an alternative to the current plan, such as extended open pit operation, the Waste Rock Management Plan will be modified appropriately and submitted to the Board as an update. There are a number of alternatives for the storage of additional waste rock such as full integration of Waste Rock Dumps 1 and 2, raising the dumps or extending the footprint to the north. Analyses to support a chosen alternative cannot be made until sufficient data have been collected.

Access to the OP/UG mine plan? The Proponent refers the Board to this document yet it has not been submitted.

The underground mine plan has not progressed beyond the conceptual engineering plans provided in the environmental impact statement because data required for detailed engineering is not available at this early stage in mining, nor the need for the analyses been confirmed.

Page iii under the Waste Dump Design Section indicates "*The layout of the two waste dumps has been optimized in order to minimize the number of catchments affected by the facilities, control seepage...*" Does the Proponent discuss how this is optimized in the document? In **Section 4.1** (Page 16) the layout of the waste dumps minimizes the number of catchments potentially affected by drainage from waste dumps and facilitates the design and operation of seepage control structures related to the waste dumps. Is there evidence presented that outlines Tahera understanding in how this is achieved?

Reference to detailed topography on the layout drawings shows that water drains toward the pit from dumps. Optimization was achieved from an earlier design which placed some dump section in the Ash-Key-Lynne lakes drainage.

Within **Section 4.1** (page 16) the Proponent reports that runoff will flow to the mine open pit. The Boards would like further detail to be presented into the understanding of drainage course from the waste piles to the open pit.

What is not clear from the drawings provided is the road network. The Layout drawing show the access roads covered by the waste dump. Obviously this is not viable. The road network will be incorporated into the perimeter of the dump. Effective slope gradients will allow us to use a ditch upstream of the road along the NW toe of Waste Dump #1 to deflect runoff or seepage to the Pit. This would mean that Pond A is not required. Similarly, Pond B is downstream of Waste Dump 2 but upstream of the pit thus it is unlikely to be required since the drainage pattern is favourable to ease of control.

Page iii briefly describes that the initial haul road will act as a waste rock containment buttress yet within the submitted drawings there is no reference. The Proponent is required to provide additional information pertaining to the initial haul road's role as a waste rock containment buttress.

The initial haul road and the waste dump are built of similar materials with similar characteristics and the suggestion of the road being a "buttress" was unfortunate. As the waste dump grows, the road will have to be relocated and as described above the most logical place is at the toe of the final footprint design.

Within the **Control Measures during Construction and Operation Section** (Page iii) the Proponent states "*Further controls are in place in order to minimize the loss of nitrogen to waste rock*". The Proponent is to detail further on how this is achieved.

Controls to minimize the loss of nitrogen to waste rock are fully detailed in the Explosives Management Plan (which see).

Under the **Verification and Monitoring Plans Section** (Page iv) the Proponent details that "*Results of these programs will be reported in an annual seepage and waste rock monitoring report*". The Proponent is required to provide further information on when this report is to be submitted to the Board.

The annual seepage report requirements are listed in the Water Licence, Part I, Item 9. The survey is to be conducted in July or August and a report submitted to the Board no later than 60 days after completion of the survey. There was no seepage survey in 2005 as the mine was under construction. The 2006 seepage survey was conducted in late July and the report from SRK to Tahera submitted to NWB.

The 2005 waste rock monitoring results were reported in the 2005 Annual report to the Water Board.

Section 2.2 (Page 10) identifies foundation conditions at the waste dump sites to be of bedrock with isolated soil deposits. The Board advises the Proponent to include materials to support the conclusions presented in an annex or to properly reference (document title, section, page) an already submitted document.

Bruce Geotechnical worked as a sub-contractor to SRK and their report is included with the SRK report.

Section 2.4 (Page 10) references a Mine Plan. The Board requests the Proponent to once again cross reference documents within the body of the WRMP.

The Mine Plan referenced was JER10410 Mine Plan submitted May 23, 2005.

Section 3.3.2 (Page 14) details that, from seepage results, there is an indication that copper exceeds CCME guidelines. The Proponent would like further detail pertaining on how seepage will be controled and treated.

Seepage controls, if needed, were described above. Since the water reports primarily to the Pit Sump it can be pumped to the process plant for treatment prior to release into the PKCA.

In **Section 4.2.1** (Page 16) the Proponent lists that a series of ephemeral streams flow across the dump site to Carat Lake. The Board requests further information focusing on how these streams can contribute to the migration of waste from the waste rock pile footprint and what is in place to mitigate this migration.

The ephemeral streams will be buried under the dump and will not contribute much, if any, to migration of waste.

Under **Section 4.4.2** (Page 18) the Proponent has stated that "*Given the size, design, failure mechanisms, and settling of the proposed waste dumps at Jericho, the consequence category is likely to be low*". The Board would like further scientific information, discussion and analysis on the aspects listed in determining Jericho to be within the low consequence category. Also the Board would like the Proponent to scientifically quantify the term '*low*' and scientifically evaluate the term '*likely*'.

"Low" and "likely" are professional judgements of SRK geotechnical engineers based on experience and comparison of Jericho dump configurations to the guidelines quoted in the plan. SRK geotechnical engineers have extensive waste dump design experience world wide and Tahera has high confidence in their professional judgement.

Table 4.2 (Page 19) provides *Case A* and *Case B* scenarios to determine the FOS. The Board requires further engineering detail into each point listed. Also as per **Section 4.4.3** (Page 19) the Proponent quotes an 'analysis'. The Proponent is advised to provide the conducted analysis (2-D DIM limit equilibrium analysis, SLOPE/W, any other geotechnical analysis for ultimate or serviceable failure and slope stability).

Case A and Case B are drawn from the quoted guidelines developed by the BC Mine Waste Rock Pile Research Committee in 1991. Categories are based on the professional experience of committee members with a broad range of mining operations. Categories are established as guideline for practicing geotechnical engineers in evaluating factors of safety. Further information is provided in the quoted guidelines.

In **Section 4.4.6** (Page 20) the Board believes that the Proponent has not provided sufficient evidence to back up the bulleted claims. The Board would like to reiterate that further information is to be provided as aforementioned in this document.

Additional information has been provided in the above responses.

Within the bulleted conclusions listed in **Section 4.4.7** (Page 21) the Proponent states that in the case where the FOS for Waste Rock Dump #1 is close to Minimum FOS that "*In the case when the water table is very high. In reality, this would correspond to a transient condition that may or may not actually occur in the field. Observations during the first year of operations should provide a better indication of what the high water table might actually be during freshet.*" The phrasing of the statement, and the statement itself, suggests that there is a lack of confidence in understanding actuality and anticipated behaviour. The Proponent is to outline what contingency is in place for a worse case scenario. What impact to water, with respect to waste, will this scenario pose? Furthermore what program is in place to provide observation during operations?

Even in the unlikely scenario described above, the dump has a factor of safety. Since an active dump requires monitoring by the shift foreman (Mines Act Regulations) the worst case scenario is that some cracking and creep may be noted. The foreman would stop equipment and personnel from working in the area and would notify the mine engineer. If the engineer determines that the conditions warrant further monitoring, a field decision would be made as to the most appropriate type and frequency.

RECOMMENDATION:

To pass along comments to Tahera to respond along with intervener comments.

TAHERA
DIAMOND CORPORATION

Table I.7
Estimated Suspended and Total Metal Concentrations in Waste Rock and Overburden

	Al mg/L	As mg/L	Cd mg/L	Cr mg/L	Cu mg/L	Fe mg/L	Pb mg/L	Mo mg/L	Ni mg/L	U mg/L	Zn mg/L
Suspended metal content of overburden											
Overburden Solids (@ TSS 10 mg/L)	0.13	0.00005	0.00001	0.0019	0.00022	0.27	0.00009	0.00003	0.00031	0.00001	0.00042
Settling Test Calculations (@[Me] 2 mg/L)	0.42			0.00088	0.0013	0.48			0.00014		0.0011
Maximum Suspended Metal Concentration (mg/L)	0.42	0.00005	0.00001	0.0019	0.0013	0.48	0.0001	0.00003	0.00031	0.00001	0.0011
Suspended metal content of waste rock											
Waste Rock Solids (@ TSS 10 mg/L)	0.068	0.00005	0.00001	0.0021	0.00032	0.18	0.00009	0.00004	0.00010	0.00000	0.00042
Seep T2 Calculations (@ [Me] 2 mg/L)	0.22	0.00003	0.00001	0.00008	0.00021	0.16	0.0025		0.00078	0.0086	0.0019
Settling Test Calculations (@ Me] 2 mg/L)	0.36				0.0043	0.43	0.0020				0.0014
Maximum Suspended Metal Concentration (mg/L)	0.36	0.00005	0.00001	0.0021	0.0043	0.43	0.0025	0.00004	0.00078	0.0086	0.0019
Final Overburden and Waste Rock Concentrations											
Dissolved BE Concentrations (mg/L)	0.23	0.0016	0.00060	0.0038	0.060	0.32	0.0005	0.038	0.019	0.27	0.024
Dissolved UB Concentrations (mg/L)	0.50	0.0031	0.00060	0.0038	0.060	1.54	0.0006	0.078	0.040	2.34	0.085
Total Metal Concentration (BE)	0.59	0.0016	0.00061	0.0058	0.064	0.75	0.0030	0.038	0.020	0.28	0.026
Total Metal Concentration (UB)	0.87	0.0032	0.00061	0.0058	0.064	2.0	0.0031	0.078	0.041	2.3	0.087

Notes: * The suspended metal content of the waste rock was used for the total metal concentrations for both overburden and waste rock.
Me = metals
BE = Best Estimate
UB = Upper Bound
Refer to text for calculation method