

December 8, 2005

Phyllis Beaulieu Nunavut Water Board Box 119 Gjoa Haven, Nunavut X0E 1J0

RE: Questions Related to Long Lake Dewatering

Ms. Beaulieu,

Please find attached Tahera Diamond Corporation's responses to questions that were submitted related to the Long Lake Dewatering at the Jericho Mine. We wish to apologize for any perceived delay in responding to these questions; however, we only became aware of these questions once they had been posted to the NWB ftp site in November.

Also included with the responses to these questions is a report on the dewatering activities associated with Long Lake and the procedures that were followed. It is our hope, that this package of information will provide the necessary information that has been requested.

Should you have any additional questions please do not hesitate to contact the undersigned.

Sincerely,

Cheryl Wray
Environmental Coordinator
Tahera Diamond Corporation
Jericho Project

Greg Missal
Vice President and Government Regulatory Affairs
Tahera Diamond Corporation
Jericho Project

Cc: Derrick Moggy, DFO



December 8, 2005

Phyllis Beaulieu Nunavut Water Board Box 119 Gjoa Haven, Nunavut X0E 1J0

RE: Response to DFO questions on the Long Lake Dewatering Plan – Jericho Diamond Mine.

This letter has been prepared in response to DFO's letter dated September 1<sup>st</sup>, 2005 and received by Tahera on November 14, regarding their review of the Long Lake Dewatering Plan submitted by Tahera Diamond Corporation July 2005.

DFO's comments have been included followed by Tahera Diamond Corporations response.

### **General Comments:**

A Fish Salvage Program has been submitted to DFO for review and a DFO Licence to Fish for Scientific Purposes has been issued to Tahera to allow the salvage to begin. Although progress on the salvage has been slow, it is expected to continue until logistics (ice conditions, etc) prevent further effort. DFO continues to work with Tahera to address this issue. This may include salvaging fish during dewatering activities, in which case the following measures should be undertaken to ensure the water intake structure on the pump is designed to protect fish:

- Extraction of water via intake is properly screened to prevent the entrainment of fish. Refer to the Freshwater Intake End-of-Pipe Fish Screen Guideline (DFO 1995), which is available upon request.
- Ensure that the holes in the screen are small enough that no fish of any size can pass through the screen and into the intake.
- The rate of water withdrawal should be such that fish do not become impinged on the screen.

#### **Response General Comments**

Fish Salvage occurred concurrently with dewatering of Long Lake for a 2 day period only. The salvage efforts commenced on August 16<sup>th</sup>, 2005 and were completed on September 5<sup>th</sup>, 2005 when the salvage was halted due to safety concerns. The fish salvage was completed prior to ice covering Long Lake. The water intake for the pump was screened with a standard mesh screen used on water supply pumps as discussed in the dewatering plan submitted to NWB. Such screens meet DFO (1995) guidelines for intake screens and are designed to prevent entrainment of fish. The intake screen is robust enough to prevent incidental damage. Periodic inspection serves to ensure damage does not occur.

Section 2.1 – Table 2.1 identifies the breakdown of the volume of water to be pumped from Long Lake, which totals 148 300 m . Of this portion, 135 000 m will be the volume to be extracted from Long Lake, to allow the lake level to be lowered by 2 meters. However, the No Net Loss



Plan (Mainstream, 2005) indicates that a volume of 100 000 m will be discharged from Long Lake over an approximate 50 day period. Please explain the discrepancy and if the 148 300 m value is the true value, does this increase the risk of erosion in Stream C3?

#### **Response Section 2.1**

The Mainstream Aquatic report indicated an approximate volume of water that required removal; the Dewatering Plan provided a better estimate of the upper limit of water that would require removal. The key parameter, however, is to lower the lake down by approximately two (2) meters. not the precise volume of water that must be removed. The Dewatering Plan provides details on a daily basis of the volume of water removal.

The pumping rate is governed by the pump available and the upper limit at which water can be discharged without exceeding freshet flows.

**Section 2.2** – It is indicated that the maximum recorded freshet flows in Stream C3 are 0.045 m /s, and so using a similar dewatering rate will not cause erosion. Freshet flows typically last for a limited period (much less then 50 days) of time and therefore the stream would be able to naturally readjust to any minor erosion problems. Should dewatering occur over a much longer period, the potential risk of erosion would increase. Please provide a comparison of the length of time for the maximum recorded freshet flow in Stream C3 and the dewatering period, and the rationale/evidence that supports the conclusion that this difference would not result in erosion in Stream C3.

#### **Response Section 2.2**

The length of time for freshet flows during the time data were collected at Jericho can be determined with reference to Figure C.16 (Technical Memorandum C). The duration of the peak flows usually occur within a one week time frame as evident from the measurements taken during year 2001. Erosion capability of flowing water is dependent upon peak velocity and the soil and vegetation characteristics of the channel. If there is no evidence of erosion at peak velocities it is unlikely to occur at velocities below the peak. The discharge rate proposed in the dewatering plan was 0.034 m<sup>3</sup>/s or about three quarters of the year 2001 maximum measured freshet flow rate of 0.045m<sup>3</sup>/s. Because of the pump capacity, actual rate of discharge is approximately 0.024 m<sup>3</sup>/s or nearly half the peak freshet flow recorded. 2001 was considered to be an average return year, it is very probable Stream C3 has experienced discharge rates resulting from 5 year to 10 year return periods a number of times over the years. Detailed examination of Stream C3 showed no evidence of scour anywhere along the stream length indicating peak freshet flows have not caused erosion in the relatively recent past.

Section 2.3 – DFO agrees that rock and grass banks/substrate are not symptomatic of an eroding bank, however under sufficient high flows for an extended period of time, these banks could be susceptible to erosion. Typically, these banks are embedded in finer material, which



could be erodable under extended periods of high flows. Once erosion starts, it may be difficult to control, particularly if dewatering continues at the proposed rate. Please provide a description of the underlying materials and how this concern will be mitigated to prevent erosion of the bank materials, both during and after dewatering.

### **Response Section 2.3**

Stream C3 for much of its length flows over and through rocky tundra with little or no fine materials. There is no accumulation of fines in the flatter muskeg areas where the stream bifurcates and where stream velocities reduce. In fact, over most of the stream course, the bottom is composed of 20 to 30 cm diameter boulders covered by diatoms and other periphyton.

There are no data on stream bank composition. Soil trenches dug by SRK in 2003 in an area north of the stream indicated soils were predominantly coarse gravely sand with some silt content. (see attached location map and logs).

There will be no concerns after dewatering if banks have not destabilized. Any destabilization would be addressed by rock armouring with rock readily available upslope from stream banks.

Section 2.4 – DFO does not agree that the use of silt curtain stretched across the stream will reduce sediment in the channel. First, silt curtains are designed for low flow scenarios, such as runoff, and not flowing water in a watercourse. Secondly, any sediment in the water will quickly plug the silt curtain thereby creating a barrier to water movement. As a result, the water will simply find alternate pathways around the silt curtain rendering the silt curtain useless. This could lead to erosion around the silt curtains as the water finds a new path. Furthermore, the maintenance necessary for the use of silt curtains (when used in this manner) is extremely high and ill-suited for the circumstance. DFO suggests that other means to control sediment be considered, and that representative drawings and a maintenance schedule of the proposed sediment control measures be provided for review.

#### **Response Section 2.4**

Silt curtains were used successfully at Jericho down slope of road construction during runoff. The screens were framed on two by fours and the bottom of the screens held down by rocks. Silt curtains are routinely used in small streams to catch sediment although they are less effective than when used for very low flows. Any other effective control such as sediment ponds constructed in the stream would cause considerably more impact that a small amount of sediment release prior to stopping pumping. Infiltration basins are used for some large construction projects to collect sediment; again, such facilities would entail mobilizing heavy equipment down Stream C3 and significant disturbance of the stream bed to construct.



Daily inspection of the entire length of Stream C3 is proposed in the Dewatering Plan, thus any erosion that occurred would be noted very quickly and pumping stopped thus resulting in a rapid reduction in flows. The plan would be to affect repairs to the stream bed through rock armouring prior to recommencing drawdown and to monitor any sites where erosion occurred for sufficient time to be assured that additional erosion was not taking place coupled with a reduction in discharge rate as advised by the hydrologist.

**Section 3.1** – The phrase "appreciably cause erosion" is a subjective evaluation. Please provide a more objective means of evaluating erosion.

### **Response Section 3.1**

Jericho's water licence requires that water discharged from Long Lake not exceed 25 mg/L maximum in any grab, thus appreciable erosion would be (in the professional judgement of the hydrologist) any volume of sediment carried into Stream C3 that, within a maximum of 100 m did not drop below 25 mg/L.

### Section 3.2:

- •DFO suggests that inspection not wait until erosion is evident, but rather identify where it may develop (or where it is developing) so that mitigative measures can be implemented to prevent it. Furthermore, it may be necessary to consider other means of mitigating erosion, i.e. reducing the pumping rate, using alternate flow paths, etc. Please provide the triggers for action and the approach to implementing a range of mitigation measures depending on the circumstances.
- •Although not expressly stated, it is assumed that the material for rock armouring will not be taken from the pathway of the discharge, including Stream C3 or any other water bodies/watercourse. Please confirm if this is the case.
- The turbidity testing suggested in the Plan implies that pumping could occur at least for one week before high TSS level have been detected. DFO suggests that a correlation between turbidity testing and the lab analysis of TSS be developed early during the dewatering activities, to allow for a quicker means of detecting potentially elevated levels of TSS.

#### **Response Section 3.2**

#### Bullet 1

The Dewatering Plan indicates that daily inspection of Stream C3 is to occur. Thus any incipient erosion will be noted and pumping cease as indicated in the plan. Once repairs were affected, pumping would restart, initially at a reduced rate until the hydrologist were satisfied that no further erosion at the site or other potentially suspect areas of the stream. If erosion were likely, the pumping rate could be reduced by lengthening the time required for dewatering.

### Bullet 2

Rock armouring would be taken from upslope of stream banks; taking rock from the stream bed would only invite erosion.



### Bullet 3

DFO's concern is noted. The commitment of Tahera for site measurements of total suspended solids has been to establish a correlation between turbidity and TSS wherever such a correlation can be established; this commitment includes Long Lake dewatering.

Should you have any additional questions please do not hesitate to contact the undersigned or site environmental staff.

Sincerely,



# **Long Lake Dewatering Summary**

**Jericho Diamond Mine** 

December 2005



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### **Executive Summary**

Pursuant to the Jericho Water Licence NWB01JER0410, Part D, Item 13 and Schedule D Item 13, Tahera Diamond Corporation submitted the Long Lake Dewatering Plan to the Nunavut Water Board on July 4<sup>th</sup>, 2005. This Dewatering Plan also addressed items required in Part G, Item 8.

As required under the Jericho Water Licence NWB01JER0410, Part G, Item 8b and Schedule D Item 13, a qualified hydrologist inspected Stream C3, prior to the commencement of dewatering, to identify areas within the natural channel that may be prone to erosion. There were no concerns during this inspection.

Dewatering, under open water conditions, was a critical schedule requirement and therefore commenced on September 2<sup>nd</sup>, 2005, sixty one days following submission of the Long Lake Dewatering Plan. Dewatering continued for 62 days from September 2<sup>nd</sup> to November 2<sup>nd</sup>. From September 2<sup>nd</sup> until October 1<sup>st</sup> dewatering occurred using a Flygt 30HP high head submersible electric pump located in a deep area at the west end of Long Lake. Average discharge rates during this period were 0.020 m3/s. On October 2<sup>nd</sup> a 4" Godwin centrifugal diesel pump was added to the dewatering effort. The average discharge flow rate from October 2<sup>nd</sup> until the completion of dewatering on November 2<sup>nd</sup> was 0.024 m3/s and a total of 114,347 m3 of water was discharged from Long Lake. The elevation of Long Lake was lowered from 514.79m to 512.40m.

Daily inspections of the entire length of the natural channel flowing to Lake C3 were conducted. Daily water quality samples were collected at the discharge point from Long Lake (LL1) as well as the inflow to Lake C3 (LL2). Evidence of erosion was not present. There were no exceedances of the water discharge criteria for Total Suspended Solids (TSS) (25mg/L maximum grab and 15mg/L for a 4 sample running average). Tables 1 and 2 provide information with regards to water quality results and daily inspections respectively.



### Introduction

Long Lake required fish salvage and partial dewatering (dewatering in this case refers to the lowering of lake water level, not complete dewatering) prior to construction of the Processed Kimberlite Containment Area (PKCA) dams. The dewatering plan was developed in accordance with the Jericho Water Licence NWB01JER0410, Part D, Item 13 and Schedule D, Item 13. This report summarizes the dewatering activities conducted from September 2<sup>nd</sup>, 2005 until the completion of dewatering on November 2<sup>nd</sup>, 2005.

Dewatering of Long Lake was constrained by two parameters.

- Discharges could not exceed the Water Licence discharge criteria for TSS, Part G Item 6 in Water Licence, which are set at 15mg/L for a 4 sample running average and 25 mg/L for any grab sample.
- Discharges could not exceed average freshet flows in stream C3 (0.034 m<sup>3</sup>/s)

Long Lake and the small ponds west and northwest of the lake contained small populations of burbot and slimy sculpins. Fish salvage took place prior to and co-incident with dewatering. Fish salvage commenced on August 16<sup>th</sup>, 2005 and was completed on September 5<sup>th</sup>, 2005 when the decision was made to discontinue the fishout due to safety concerns related to accessing the shorelines on foot and the pending freeze-up of Long Lake.

### **Hydrological Assessment**

Pursuant to the Jericho Water License NWB01JER0410, Part G Item 8b a qualified hydrologist was employed to provide a hydrological assessment of Stream C3 prior to the commencement of dewatering and to ensure mitigative responses were in place should hydraulic erosion become evident due to the rate of dewatering. Following is a summary of the assessment and a copy of the signed stamped letter provided by the hydrologist has been included in Appendix A.

The hydrologist arrived on site September 1<sup>st</sup>, 2005, reviewed site conditions and established seven monitoring stations in locations that were potentially susceptible to erosion activity. Dewatering commenced on September 2<sup>nd</sup>, 2005. A pumping rate of 0.020 m3/s (based on surveyed lake level measurements) was maintained for the duration the hydrologist was on site. Inspections over the entire length of Stream C3 were conducted on September 3<sup>rd</sup> and 4<sup>th</sup>, 2005 with no signs of bank erosion or visible turbid water.

The hydrologist was on site from September 1<sup>st</sup>, 2005 to September 5<sup>th</sup>, 2005 and had been in regular communication with site personnel throughout the successful dewatering of Long Lake.



### **Dewatering**

Dewatering of Long Lake commenced on September 2<sup>nd</sup>, 2005 sixty one days following the submission of the dewatering plan required under the Jericho Water Licence NWB01JER0410, Part D, Item 13 and Schedule D, Item 13.

The initial phase of dewatering utilized a Flygt 30HP submersible electric pump mounted on a float and suspended 0.5m below surface. The pump was located in a deep area at the west end of Long Lake. The discharge line extended to a rocky area on the Northeast shoreline of the West Pond. Average discharge rates from the 30HP Flygt pump were 0.020 m<sup>3</sup>/s.

As the water level in Long Lake approached the elevation of water in the West Pond backflow into Long Lake from the West pond began to occur. On September 25<sup>th</sup>, the discharge line was relocated west of the West pond along Stream C3. At this time the decision to add an additional pump to supplement discharge volumes was also made.

A second pump was added to the dewatering operation on October 2<sup>nd</sup>, 2005. The second pump was a 4" Godwin centrifugal diesel pump which was located 30m from the shoreline on the southside of Long Lake. The intake from this pump was attached to the float used to suspend the 30HP Flygt pump. The addition of the second pump increased the average discharge rate to 0.024 m³/s. Dewatering continued with both pumps in operation until November 2<sup>nd</sup>, 2005; when the target elevation had been achieved.

Dewatering occurred for a total of 62 days between September 2<sup>nd</sup> and November 2<sup>nd</sup> and a total of 114,347 m3 was discharged from Long Lake. The water elevation of Long Lake was lowered from 514.79m to 512.40m.

### **Monitoring**

Monitoring of dewatering activities occurred on a daily basis and consisted of two components;

- Water sampling daily water samples were collected at two locations. One sample
  was collected at the discharge from Long Lake (LL1). This station was used to
  monitor water quality in Long Lake. The other sample was collected at the outlet of
  Stream C3 (LL2) prior to entering Lake C3. This station served to measure water
  quality in the event there was erosion along the C3 stream.
- Visual Inspections daily visual inspections were conducted from the discharge point along Stream C3 to Lake C3. Inspections consisted of examining stream bottom for scour and bank erosion.



During the 62 days of dewatering there were 58 samples collected at the Long Lake discharge point (LL1) and 54 samples collected at the outlet of Stream C3 into Lake C3 (LL2). An explanation of the missed samples is as follows;

- At both sampling locations (LL1 and LL2) on September 11<sup>th</sup>, October 13<sup>th</sup> and October 27<sup>th</sup>, poor visibility due to blowing snow prohibited travel to the sampling sites in order to collect samples.
- At both sampling locations (LL1 and LL2) one sample was missed on September 25<sup>th</sup> when the pump was shutdown to relocate the discharge line west of the West Pond.
- Four additional samples were missed at location LL2 as visibility did not allow the collection of samples at Lake C3.

There were no exceedances of the water discharge criteria for TSS (25mg/L maximum grab and 15mg/L for a 4 sample running average) and water quality results were typically near detection limit.

For the 58 samples collected at Station LL1, the average TSS and Turbidity measurements were 3mg/L and 3 NTU respectively. The maximum recorded measurement at LL1 was 13mg/L TSS and 15 NTU on October 10<sup>th</sup>.

For the 54 samples collected at LL2 the average TSS and Turbidity measurements were 2mg/L and 2 NTU respectively. The maximum recorded measurement at LL2 was 5mg/L TSS and 5 NTU Turbidity on October 28<sup>th</sup>.

Table 1 summarizes the results of the water quality analysis.

Daily inspections conducted along stream C3 between the discharge point and Lake C3 showed no evidence of erosion. As dewatering continued and the wetland areas became saturated the flow broadened into multiple channels. As the amount of snow increased the flow continued through the snow covered channels. Table 2 provides information recorded during daily inspections.



### **Summary**

Dewatering commenced on September 2<sup>nd</sup>, 2005 and continued for 62 days between September 2<sup>nd</sup> and November 2<sup>nd</sup>. From September 2<sup>nd</sup> until October 1<sup>st</sup> dewatering occurred using a Flygt 30HP high head submersible electric pump located in a deep area at the west end of Long Lake. Average discharge rates during this period were 0.020 m3/s. On October 2<sup>nd</sup> a second 4" Godwin centrifugal diesel pump was added to the dewatering effort and the average discharge flow rate from this day forward until the completion of dewatering was 0.024 m3/s. A total of 114,347 m3 was discharged from Long Lake and the water elevation of Long Lake lowered from 514.79m to 512.40m.

Daily inspections of the entire length of the natural channel flowing to Lake C3 were conducted and water quality samples collected at the discharge point from Long Lake (LL1) and the inflow to Lake C3 (LL2). No evidence of erosion was present and no exceedances of the water discharge criteria for TSS (25mg/L maximum grab and 15mg/L for a 4 sample running average).



# **Tables**

Table 1: Water Quality Data

Table 1: Wat	er Quality Da	ata	1		
		Turbidity	Total Suspended Solids @105°C		
	Collect	-			
Station Name	Date/Time	NTU	mg/L		
LL1 LL1	9/2/2005 9/3/2005	<1 <1	<2 <2		
LL1	9/4/2005	1	<2		
LL1	9/5/2005	1	<2		
LL1	9/6/2005	1	<2		
LL1	9/7/2005	1	<2		
LL1	9/8/2005	1	<2		
LL1	9/9/2005	1	<2		
LL1	9/10/2005	1	3		
LL1	9/11/2005	NC	NC		
LL1	9/12/2005	2	<2		
LL1	9/13/2005	1	<2		
LL1	9/14/2005	2	<2		
LL1	9/15/2005	1 2	<2		
LL1 LL1	9/16/2005	2	<2 <2		
LL1	9/17/2005 9/18/2005	1	<2		
LL1	9/19/2005	2	<2		
LL1	9/20/2005	2	<2		
LL1	9/21/2005	2	<2		
LL1	9/22/2005	1	<2		
LL1	9/23/2005	2	<2		
LL1	9/24/2005	1	<2		
LL1	9/25/2005	NC	NC		
LL1	9/26/2005	2	<2		
LL1	9/27/2005	2	2		
LL1	9/28/2005	2	2		
LL1	9/29/2005	3	2		
LL1 LL1	9/30/2005	2	2		
LL1	10/1/2005 10/2/2005	2	<2 2		
LL1	10/2/2005	2	3		
LL1	10/4/2005	2	3		
LL1	10/5/2005	3	3		
LL1	10/6/2005	2	<2		
LL1	10/7/2005	6	4		
LL1	10/8/2005	7	5		
LL1	10/9/2005	6	4		
LL1	10/10/2005	15	13		
LL1	10/11/2005	2	<2		
LL1	10/12/2005	6	5		
LL1	10/13/2005	NC	NC O		
LL1 LL1	10/14/2005 10/15/2005	3	2 <2		
LL1	10/15/2005	4	<2		
LL1	10/17/2005	3	2		
LL1	10/18/2005	4	2		
LL1	10/19/2005	4	<2		
LL1	10/20/2005	3	3		
LL1	10/21/2005	3	3		
LL1	10/22/2005	2	4		
LL1	10/23/2005	3	3		
LL1	10/24/2005	3	3		
LL1	10/25/2005	4	3		
LL1	10/26/2005	NC	NC 2		
LL1 LL1	10/26/2005 10/28/2005	5	3		
LL1	10/28/2005	5 5	3		
LL1	10/29/2005	5	3		
LL1	10/30/2005	4	4		
LL1	11/1/2005	5	4		
LL1	11/2/2005	6	5		
Average		3	3		
Count		58	58		
Maximum		15	13		

		Turbidity	Total Suspended Solids @105°C		
Station	Collect				
Name	Date/Time	NTU	mg/L		
LL2 LL2	9/2/2005 9/3/2005	1	<2 <2		
LL2	9/4/2005	1	<2		
LL2	9/5/2005	<1	<2		
LL2	9/6/2005	1	<2		
LL2	9/7/2005	1	<2		
LL2	9/8/2005	1	<2		
LL2	9/9/2005	<1	<2		
LL2	9/10/2005	<1	<2		
LL2	9/11/2005	NC	NC		
LL2	9/12/2005	1	<2		
LL2	9/13/2005	2	<2		
LL2	9/14/2005	<1	<2		
LL2 LL2	9/15/2005	<1	<2		
LL2 LL2	9/16/2005 9/17/2005	2	<2 3		
LL2	9/17/2005	<1	<2		
LL2	9/19/2005	1	<2		
LL2	9/20/2005	1	<2		
LL2	9/21/2005	1	<2		
LL2	9/22/2005	2	<2		
LL2	9/23/2005	2	<2		
LL2	9/24/2005	1	<2		
LL2	9/25/2005	NC	NC		
LL2	9/26/2005	1	<2		
LL2	9/27/2005	1	2		
LL2	9/28/2005	2	<2		
LL2	9/29/2005	1	<2		
LL2 LL2	9/30/2005	<1 2	<2 2		
LL2	10/1/2005 10/2/2005	2	<2		
LL2	10/3/2005	2	<2		
LL2	10/4/2005	2	<2		
LL2	10/5/2005	2	4		
LL2	10/6/2005	2	2		
LL2	10/7/2005	NC	NC		
LL2	10/8/2005	3	<2		
LL2	10/9/2005	3	2		
LL2	10/10/2005	NC	NC		
LL2	10/11/2005	NC	NC NC		
LL2	10/12/2005	NC	NC NC		
LL2 LL2	10/13/2005 10/14/2005	NC 2	NC		
LL2 LL2	10/14/2005	2	<2 4		
LL2	10/16/2005	3	4		
LL2	10/17/2005	3	<2		
LL2	10/18/2005	3	<2		
LL2	10/19/2005	3	2		
LL2	10/20/2005	2	<2		
LL2	10/21/2005	2	<2		
LL2	10/22/2005	2	<2		
LL2	10/23/2005	2	<2		
LL2	10/24/2005	3	<2		
LL2	10/25/2005	3 NC	<2 NC		
LL2 LL2	10/26/2005 10/26/2005	NC 3	NC 2		
LL2 LL2	10/26/2005	3 5	5		
LL2	10/29/2005	1	<2		
LL2	10/29/2005	1	<2		
LL2	10/31/2005	1	<2		
LL2	11/1/2005	2	<2		
LL2	11/2/2005	5	5		
Average		2	2		
Count		54	54		

Table 2: Daily Inspection Log

Table 2: Da	Table 2: Daily Inspection Log													
						01	Long			0 1				
					Sample	Stream C3 Staff	Lake Staff			Cumulativ	Volume	Cumulativ	Avg Flow	
		Generator	Generator	Frosion	Collected		Gauge	Elevation	Decrease	Decrease	discharged	e Volume	Rate	
Date	Time	Hours	RPM	(Y/N)	(Y/N)	(m)	(m)	(m)	(cm)	(cm)	(m3)	(m3)	(m3/s)	Comments
2-Sep-05	18:00	20448	1797		Ϋ́	0.06	0.96	514.79	,	,	405	405		Basline prior to dewatering
3-Sep-05	9:06	20463	1797	N	Υ	0.24	0.93	514.76	3.0	3.0	1,769	2,174	0.020	Vegetation Particles in LL2
4.005	40.00	00.400	4707	<b>.</b> .	.,	0.04	0.045	54475			4 700	0.040	0.000	Wetland areas becoming saturated flow broadening into
4-Sep-05	10:00	20488	1797		Y	0.24	0.915	514.75	1.5	4.5 8.0	1,769	3,943	0.020	more channels
5-Sep-05 6-Sep-05	13:05 15:27	20515 20541	1797 1797		Y	0.235	0.88 0.85	514.71 514.68	3.5	11.0		5,713 7,482	0.020 0.020	
7-Sep-05	13:35	20563	1797		Y	0.235	0.83	514.66	2.0	13.0	1,769	9,251	0.020	
8-Sep-05	13:00	20587	1797	N	Υ	0.235	0.79	514.62	4.0	17.0		11,020	0.020	
9-Sep-05	13:30	20611	1797		Υ	0.235	0.77	514.60	2.0	19.0		12,789	0.020	
10-Sep-05	13:45	20635	1797	N	Υ	0.235	0.79	514.62	-2.0	17.0	1,769	14,558	0.020	
44 0 05					NI.		0.79	E44 C0		17.0	1,769	40 007	0.020	10/Lite t dition d line (I   1 d   1   2)
11-Sep-05 12-Sep-05	13:40	20682	1797	N	V	0.235	0.79	514.62 514.62	0.0	17.0		16,327 18,096	0.020	Whiteout conditions prevented sampling (LL1 and LL2)
13-Sep-05	14:00	20706	1791		Y	0.235	0.77	514.60	2.0	19.0	1,769	19,865	0.020	
14-Sep-05	8:05	20724	1791	N	Υ	0.235	0.79	514.62	-2.0	17.0	1,769	21,634	0.020	
15-Sep-05	13:35	20754	1791		Υ	0.235	0.79	514.62	0.0	17.0	1,769	23,403	0.020	
16-Sep-05	15:09	20719	1793		Y	0.235	0.77	514.60	2.0	19.0	1,769	25,172	0.020	
17-Sep-05 18-Sep-05	14:08 14:10	20802 20826	1769 1742		Y	0.235	0.77 0.76	514.60 514.59	0.0 1.0			26,941 28,710	0.020 0.020	
19-Sep-05	13:09	20849	1742	N	Y	0.235	0.70	514.52	7.0	27.0	1,769	30,479	0.020	
20-Sep-05	14:46	20874	1789		Y	0.235	0.68	514.51	1.0	28.0	885	31,364	0.010	
21-Sep-05	8:45	20892	1789		Υ	0.235	0.67	514.50	1.0	29.0		32,211	0.010	
22-Sep-05	12:45	20920	1789		Υ	0.235	0.69	514.52	-2.0	27.0		33,980	0.020	
23-Sep-05	13:30	20945	1789	N	Υ	0.235	0.68	514.51	1.0	28.0	1,769	35,749	0.020	Cteff and a lead a lead and a sandian a sandian a
24-Sep-05	8:55	20964	1789	N	V	0.21	ICE				590	36,339	0.007	Staff gauge iced over unable to continue readings on staff gauge.
24-3ep-03	0.00	20904	1703	IN		0.21	ICL				330	30,333	0.007	Pump shutdown to relocate discharge line past the West
														Pond, as Long Lake and West Pond elevations
														equalized back flow was occuring into Long Lake.
25-Sep-05	14:00				N	No Flow					1,179	37,518	0.014	Samples not collected at LL1 and LL2.
26 Cap 05	10:00	21022	1789	N.	v						1,769	39,287	0.020	Stream C3 staff gauge no longer applicable as dischrge
26-Sep-05 27-Sep-05	13:30	21022	1789		Y						1,769	41,056	0.020	line is downstream of this gauge.
28-Sep-05	10:30	21071	1789		Y						1,769	42,826	0.020	
29-Sep-05											1,769	44,595	0.020	
30-Sep-05	13:30	21098	1787		Υ			514.26	25.0	53.0	1,769	46,364	0.020	Long Lake Elevation surveyed
1-Oct-05	13:30	21123	1820		Y						1769.0	48,133	0.020	O I
2-Oct-05 3-Oct-05	16:00 14:00	21148 21171	1801 1804		Y						2069.2 2069.2	50,202 52,271	0.024 0.024	Second pump installed
4-Oct-05	14:30	21171	1804		Y						2069.2	54,340	0.024	
5-Oct-05	13:00	21218	1804		Υ						2069.2	56,409	0.024	
6-Oct-05	9:15	21238	1804		Υ						2069.2	58,479	0.024	
7-Oct-05	15:52	21268	1804		Υ						2069.2	60,548	0.024	Whiteout conditions prevented sampling at LL2
8-Oct-05 9-Oct-05	13:45 15:45	21290 21316	1804 1804		Y Y						2069.2 2069.2	62,617 64,686	0.024 0.024	
10-Oct-05	16:04	21340	1804		Y						2069.2	66,755	0.024	Whiteout conditions prevented sampling at LL2
10 001 00	10.01	21010	1001								2000.2	00,100	0.021	Long Lake Elevation surveyed, whiteout conditions
11-Oct-05	16:09	21365	1806	N	Υ			514.01	25.0	78.0	2069.2	68,825	0.024	prevented sampling at LL2
12-Oct-05	16:04	21388	1785	N	Υ						2069.2	70,894	0.024	Whiteout conditions prevented sampling at LL2
42.04.05				1	l.				1		2000	70.000	0.004	M/Literature and ities a second and all and it is a literature of the control of
13-Oct-05 14-Oct-05	14:22	21434	1779	N	N Y				<del>                                     </del>		2069.2 2069.2	72,963 75,032	0.024 0.024	Whiteout conditions prevented sampling (LL1 and LL2)
15-Oct-05	14:19	21454	1779		Y				l		2069.2	77,101	0.024	
16-Oct-05	14:50	21483	1764	N	Υ						2069.2	79,171	0.024	
17-Oct-05	14:45	21508	1764	N	Y						2069.2	81,240	0.024	
18-Oct-05	11:45	21527	1760		Y			513.76	25.0	103.0	2069.2	83,309	0.024	
19-Oct-05 20-Oct-05	11:00 14:00	21550 21578	1762 1454		T V				<del>                                     </del>		2069.2 2069.2	85,378 87,447	0.024 0.024	
21-Oct-05	14:00	21578	1454		Y				1	1	2069.2	87,447	0.024	
22-Oct-05	13:00		1806		Υ			513.56	20.0	123.0	2069.2	91,586	0.024	
23-Oct-05	13:30	21648	1804	N	Υ						2069.2	93,655	0.024	
24-Oct-05	13:30	21672	1806	N	Y						2069.2	95,724	0.024	
25-Oct-05	11:30 13:00	21694 21720	1806		Y			513.38	18.0	141.0	2069.2	97,793	0.024	
26-Oct-05	13:00	21720	1804	IN	T				<del> </del>		2069.2	99,863	0.024	
27-Oct-05				l	N				l		2069.2	101,932	0.024	Whiteout conditions prevented sampling (LL1 and LL2)
28-Oct-05	14:30	21769	1804		Υ			513.20	18.0	159.0	2069.2	104,001	0.024	, , , , , , , , , , , , , , , , , , , ,
29-Oct-05	13:30	21792	1804	N	Υ						2069.2	106,070	0.024	-
30-Oct-05	14:00	21818	1804		Y						2069.2	108,139	0.024	
31-Oct-05 1-Nov-05	13:00 14:10	21841 21866	1804 1804		Y				<u> </u>		2069.2 2069.2	110,209 112,278	0.024	
2-Nov-05	13:45	21888	1804		Y				<del> </del>		2069.2	112,278		Final Day of Dewatering
3-Nov-05	10.40	21000	1004	l '	-				1		2000.2	,047	0.024	/ or bondoning
4-Nov-05								512.4	80	239.0				Long Lake Elevation Surveyed



# **Appendix A**



24 November 2005

AMEC File:VE51295

#### **VIA Electronic**

Tahera Diamond Corporation Jericho Diamond Mine

Attention: Mike Tanguay

Reference: Long Lake Dewatering

**Hydrologist Monitoring Report** 

Pursuant to a condition of the Jericho Water License NWB01JER0410 the writer was on site to provide the Hydrologist oversight for the dewatering of Long Lake. The purpose of this oversight was to ensure mitigative responses were in place should hydraulic erosion become evident in Stream C-3 due to the rate of dewatering.

The writer arrived on site 01 September 2005, reviewed site conditions and established seven monitoring stations in locations that were deemed as being the most potentially susceptible to erosion activity.

Dewatering commenced on 02 September using a Flygt 30HP high head submersible pump suspended from a floating platform in Long Lake, the outlet line discharged on a boulder covered bank of West Lake. A pumping rate of 0.02 m³/s (based on surveyed lake level measurements) was maintained for the duration the writer was on site. Inspections over the entire length of Creek C3 were conducted on 03 and 04 September with no signs of bank erosion or visible water turbidly.

It is the writers opinion that based on the ground conditions evident during the start up of the Long Lake dewatering program and subject to the prescribed inspections by site environment personnel the pumping rate can be increased up to the average freshet flow rate of 0.034 m3/s without additional on site inspections by a Hydrologist.

The writer was on site from 01 September 2005 to 05 September 2005 and has been in regular communication with site personnel throughout the successful dewatering of Long Lake.

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Tahera Diamond Corporation Jericho Diamond Mine 24 November 2005 VE51295 Page 2



Yours truly,

### **AMEC Earth & Environmental**



M.J. (Jim) Bester, P.Eng. Water Resources Engineer

Reviewed by:

John R. Slater, P.Eng. Principal Water Resources Engineer