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Tahera
Diamond Corporation

General Operational Monitoring Plan
Water Licence **NWB1JER0410**
Jericho Diamond Mine
Nunavut, Canada

Submitted to:

Tahera Diamond Corporation

Toronto, Ontario

Submitted by:

AMEC Earth & Environmental
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EXECUTIVE SUMMARY

This general monitoring plan fulfills the requirements of Jericho Water Licence **NWB1JER410** Part L, Conditions Applying to General and Aquatic Effects Monitoring Plans, Section 1 which requires a general monitoring plan for the mine. The objective of the plan is to provide information on the extent of influence of mine operations on the water chemistry of site and receiving waters at the mine which will provide data for adaptive management strategies to improve mitigation where indicated. The plan covers pre-construction, construction and operation of the Jericho Diamond Mine.

Site monitoring will include all areas of the mine where seepage occurs or where surface water is collected and treated; both quality and quantity will be monitored. As well the amount of ore, wastes and overburden or till handled will be tracked. The frequency of monitoring will vary from daily to monthly, depending on the stream being monitored.

Receiving environment monitoring covered in this plan focuses on water chemistry. Control and potentially affected sites will be monitored on a monthly basis; three sites not directly affected by mine operations will be monitored annually. Controls include upstream and downstream and a separate drainage basin. Potentially affected sites will be close to the discharge and some distance away from the discharge (nearfield and farfield). Since the mine has the potential to affect both federally controlled and Inuit lands, sampling will occur on both.

A total of 18 receiving water quality sites, including the water intake and Processed Kimberlite Containment Area (PKCA) discharge, are included in the surveillance network program; eight of these sites were included in the baseline water quality monitoring program which commenced in 1995. At least 14 sampling locations are located on the Jericho Diamond Mine site exclusive of seeps. Twelve thermistor strings will be installed on dams and stockpiles to monitor temperature changes in these facilities.

A quality control program will be instituted for field and laboratory sampling and analyses. All instruments used in the field and laboratory will be calibrated as indicated by manufacturers or established protocols in the laboratory.

Triggers that will invoke adaptive management for the site would be significant changes in water chemistry of monitored water or significant changes in the thermal regime for dams and stockpiles. Exceedance of site specific water quality guidelines in the receiving environment or significant changes in aquatic biota noted from the aquatic effects monitoring program (discussed elsewhere) would also trigger adaptive management to improve mitigation and reduce concentrations of problematic water parameters where possible.

All data will be stored electronically and on paper. Reports will be prepared as required by the Water Licence, either monthly or annually.

1.0 INTRODUCTION

The Jericho Diamond Project is being developed by Tahera Diamond Corporation on behalf of its wholly owned subsidiary, Benachee Resources Inc. The mine site is located approximately 420 km north northeast of Yellowknife, NWT, in the West Kitikmeot region of Nunavut.

A copy of the recommendation to the Minister of DIAND for a Project Water Licence was received from Nunavut Water Board 22 December 2004 and sign off by the DIAND Minister 26 January 2005. A number of plans must be developed under the terms of the Water Licence and the general monitoring plan is detailed in this document.

This general monitoring plan fulfills the requirements of Jericho Water Licence NWB1JER410 Part L, Conditions Applying to General and Aquatic Effects Monitoring Plans, Section 1 which requires a monitoring plan for the mine as set out under Schedule L, Section 1. The following terms apply:

a. Updated operation monitoring plan which reflects the requirements of the licence.
b. Describe the assessment of Stream C3 by a hydrologist and, if required, erosion protection measures required. **Note:** this requirement will be addressed in an addendum report from the consultant hydrologist engaged prior to Long Lake dewatering as Stream C3 in winter is completely frozen and snow covered. Thus it is not possible at the time of writing of this plan to comply with this requirement.

The Jericho Water Licence **NWB1JER410** is attached as Appendix A.

2.0 OBJECTIVES AND SCOPE OF THE GENERAL MONITORING PLAN

2.1 Objectives

- To provide information on the extent of influence of mine operations on the water chemistry of site and receiving waters for the mine.
- To build on the water quality data base collected from 1995 through 2001 as part of baseline studies in support of the Jericho Diamond Project environmental impact statement.
- To allow feedback to the adaptive management plan which will be used to assess mitigation and management at the mine.
- To provide data to modify and improve mitigation where indicated.

2.2 Scope

The general monitoring plan covers site and receiving environment monitoring as set out in the Jericho Diamond Mine Water Licence. A separate plan was developed for aquatic effects monitoring and relevant parts of this plan are also included in the aquatic effects monitoring plan. The mining phases covered by this plan are:

- pre-construction;
- construction; and
- operation

as required by the Water Licence. Closure monitoring (including temporary, indefinite and permanent shutdown) is discussed in the Abandonment and Restoration Plan for the project and will be updated as required by the Water Licence in that plan.

2.3 Previous Water Quality Monitoring

Table 2-1 provides a listing of baseline water quality history.

Table 2-1: Baseline Water Quality Sampling History

Lake	Sample Site	Location Description	Sampling Dates
Cigar Lake	CL-01	control site	1995: 7, 8, 9, 11 1996: 4, 7, 8, 9, 12
	CL-02		1995: 7, 8, 9, 11 1996: 4, 7, 8, 9, 12 1997: 7 1998: 8 1999: 4, 7, 8, 9
Carat Lake	CL-03	project site	1995: 7, 8, 9, 11 1996: 4, 7, 8, 9, 12 1997: 7 1998: 8
	CL-04		1995: 7, 8, 9, 11 1996: 4, 7, 8, 9, 12 1997: 7 1998: 8
	CL-05		1995: 7, 8, 9, 11 1996: 4, 7, 8, 9, 12 1997: 7 1999: 4, 7, 8, 9
Jericho Lake Outlet	CL-06	downstream of project	1995: 7, 8, 9, 11 1996: 4, 7, 8, 9, 12 1998: 8 1999: 7, 8, 9
	CL-07		1995: 7, 8, 9, 11 1996: 4, 7, 8, 9, 12
	CL-08		1995: 7, 8, 9, 11 1996: 4, 7, 8, 9, 12
Kathawachaga Lake	CL-09	mouth of Jericho River	1995: 7, 8, 9, 11 1996: 4, 7, 8, 9, 12
	CL-10	mouth of Burnside River	1995: 7, 8, 9, 11 1996: 4, 7, 8, 9, 12
Tailings Lake	CL-12		1997: 7
Seep Creek	CL-13		1997: 7
Key Lake	CL-14		1996: 4, 7, 8, 9, 12
Pocket Lake	CL-15		1996: 4, 7, 8, 9, 12
Lynne Lake	CL-16		1996: 4, 7, 8, 9, 12
Ash Lake	CL-17		1996: 4, 7, 8, 9, 12
Contwoyto Lake	CL-18	proposed dock facility	1996: 7, 8, 9, 12
	CL-19	halfway to Lupin	1996: 7, 8, 9, 12
	CL-20	3/4 to Lupin	1996: 7, 8, 9, 12
3 unnamed lakes	CL-21	near airstrip	1996: 6, 7, 8, 9
	CL-22		1996: 6, 7, 8, 9
	CL-23		1996: 6, 7, 8, 9
Long Lake	CL-25	potential tailings pond, near outlet	1999: 7, 8, 9
Key Lake outlet stream	CL-26		1999: 7, 8, 9
Lynne Lake outlet stream	CL-27		1999: 7, 8, 9
Lake C3	CL-28	upstream of Carat	1999: 8, 9
Lake C4	CL-31		2000: 8, 9

Table 2-2 provides a comparison between baseline station water quality sampling and the surveillance network program for mine operation.

Table 2-2: Baseline – Operational Monitoring Comparison

Baseline Monitoring Station	Location	Operations Monitoring Station
CL-02	Cigar Lake	JER-WQ11
CL-04	Carat Lake Central Basin	JER-WQ5
CL-06	Jericho Lake	JER-WQ8
CL-14	Key Lake	JER-WQ17
CL-16	Ash Lake	JER-WQ18
CL-17	Lynne Lake	JER-WQ16
CL-28	Lake C3	JER-WQ4
CL-31	Lake C4	JER-WQ14

Baseline water quality monitoring was discussed in detail in the Jericho Final EIS filed with the Nunavut Environmental Impact Review Board and the Nunavut Water Board. See Figure 1 for surveillance network program sampling sites.

3.0 OVERVIEW

3.1 Site Monitoring

The monitoring locations representing internal flows at the site (i.e. to the pit sump or PKCA) are intended to provide an early indication of how the systems are performing. This information will be used by the mine operator to make adaptive management decisions and projections of PKCA discharge water quality. Sampling of the PKCA inflows would be on a bi-weekly basis during the open water season (generally June to September) for the first two years of operations. The PKCA pond and any inflows that continue through the winter months (i.e. the supernatant and the treated sewage) would be monitored on a monthly basis.

3.1.1 Flows and Water Chemistry

Flows and water quality will be monitored at key locations in the site water management system to anticipate any significant deviations from the conditions assumed in the current water and load balance that could indicate the need for management to ensure that the PKCA discharges continue to meet discharge criteria. The site monitoring program will be complemented by monitoring of the waste rock, kimberlite, processed kimberlite solids, recovery plant rejects, monitoring of receiving water quality, and environmental effects monitoring. Details of those other programs are provided in the *Waste Rock, Kimberlite and Coarse PK Management Plan* (SRK 2004) and the *Aquatic Effects Monitoring Program* (Mainstream Aquatics 2004).

Key locations in the site water monitoring network are shown on Figure 2. These include:

- Temporary or permanent collection ditches or ponds A, B and C, which will be used as control structures to direct water to the pit sump or PKCA during operations
- The pit sump.
- The process plant supernatant.
- Treated sewage effluent.
- PKCA pond water.
- PKCA discharge water.
- Stream C3 during PKCA discharge for signs of erosion (periodically, as required).

During the first two years of operations, each of the above locations would be established as "routine monitoring stations" for measurement of flow and water quality. Sampling of the PKCA inflows would be on a monthly basis during the open water season (generally June to September). The PKCA pond and any inflows that continue through the winter months (i.e. the supernatant and the treated sewage) would continue to be monitored on a monthly basis during the winter. The PKCA discharge would be monitored on a weekly basis during the discharge period from June through September; flows will be continuously monitored.

The methods for estimating flow will depend on the final details of the water management facilities. Any pumped flows would be equipped with totalizer meters to record the total throughput of water occurring between sampling events. Ditch flows would be monitored using weirs, and piped flows directed by gravity would be measured using bucket and stopwatch methods.

An annual seepage survey would be completed along the down-gradient side of each of waste rock dump, ore stockpile, coarse PK stockpile, recovery plant stockpile and any sumps in the plant area to develop a better understanding of variations in source concentrations from different areas of site. This information may be used to optimize the water management system. For example, seeps that meet discharge criteria may be managed separately from those that do not. Based on Ekati Diamond Mine™ seepage chemistry, this sampling will take place in July or August to coincide with maximum seepage concentrations. It should be noted that the provision of routine monitoring stations at each of the collection points ensures that seepage and runoff from the waste rock is monitored on a seasonal basis. Therefore an annual seepage survey is considered sufficient for characterizing variability in the source concentrations from different areas of the dumps and stockpiles.

3.1.2 Solids Geochemistry

Geochemical monitoring will be carried out to confirm the geochemical properties of the waste rock, low-grade kimberlite ore, fine PK, coarse PK and recovery plant rejects.

Waste rock and low-grade kimberlite ore samples will be collected as grab samples from the muck pile produced by blasting. In the first two years of the mine operation blasting will occur approximately once per day, with approximately one blast per two days in the next two years of mining. Characterization of the waste rock should include:

- Sample collection during every week for the first year of mining, and, assuming that the testing data indicates minimal variability in the geochemistry of the waste rock, the sample frequency would be reduced to every other week for the remaining years of mining.

- Sample collection from each rock type present in the blast (i.e. granite/granodiorite, pegmatite, diabase, waste kimberlite).

- Geological description of the sample by a geologist or engineer, and general geological observations of the blasted rock, such as presence and composition of any xenoliths, occurrence of sulphide minerals etc.

- Testing of paste pH, reaction with HCl, total sulphur, and uranium on every sample. (Uranium analyses may be discontinued after the first year of testing if uniformity can be demonstrated). Full ABA analyses and ICP-metals would be performed on every 10th sample.

- Testing of a duplicate sample every 10th sample.

3.1.3 Ground Ice

During collection of the waste rock samples, blasted rock and freshly blasted rock faces will be examined for presence of significant quantities of ground ice. If present, the quantity of ice will be estimated, and samples of the ice lenses will be collected and submitted for water quality analyses to characterize the quality of ice melt water that would report to the pit or waste rock dumps. The frequency of sampling would depend on the amount of ice encountered, and the water quality data from the first few samples. However, based on observations from the underground development and drilling, it is considered unlikely that significant amounts of ice will be encountered.

3.1.4 Thermal Monitoring

A number of thermistors will be installed in the waste rock dumps and the Coarse PK Stockpile, including:

- two locations in waste dump one;

- two locations in waste dump two; and
- two locations in the coarse PK stockpile.

Two thermistors per dam will also be installed in the frozen zone of each of the dams. Thermistor readings will be collected on a monthly basis for a period of two years, or until a clear pattern has been established. Thereafter the reading frequency will be quarterly.

3.1.5 Site Surveys and Visual Inspections

Three pairs of survey hubs will be established on each of the dams to monitor dam movements should they occur.

During the active development of each of the mine components, site staff will carry out daily inspections of these facilities (PKCA, including dams, all collection ponds, water control dikes, waste rock dumps and stockpiles), including slope stability, seepage and conformity to the development footprint. When activity ceases on an interim or seasonal basis, the inspection frequency will shift to monthly. Following completion of a component, inspections will continue on a semi-annual basis to closure.

Formal semi-annual inspections will also be carried out by site personnel, one of which will be conducted by an independent professional geotechnical or civil engineer.

Stream C3 will be inspected prior to discharge of the PKCA by a qualified hydrologist to determine the potential for erosion under discharge scenarios. Stream C3 will be inspected periodically as required during Long Lake pump out and PKCA discharge to determine whether bank or bed erosion is occurring. Should erosion be occurring, pumping/discharge will cease and rock armouring will be placed at the erosion site prior to commencement of pumping/discharge.

The water management facilities which specifically include the collector ditches and ponds below each dump or stockpile as well as various sumps will be monitored by site staff on a daily basis during freshet, weekly during summer and fall and once during the winter.

3.1.6 Stream Flows

An automated water level recorder equipped with a radio link will be installed near the outlet to Lake C3 prior to mine start up. Appendix B contains information on typical equipment that can be used for this application[1]. The recorder will be fitted with a radio link to the control room of the diamond processing plant where data can be monitored in real time if required. The water level recorder will be operated whenever PKCA discharge is occurring. A minimum of three (3) benchmarks will be established on bedrock near the site to allow lake levels to be periodically surveyed in order to calibrate actual lake levels with the recorder's readings. A suitable location will be selected in the C3 outlet stream (Jericho River) to measure stream discharge. The stage discharge curve developed as part of baseline studies and reported in the Jericho Final EIS will be upgraded with additional information to improve the relationship between lake water level and lake outlet discharge. This relationship, coupled with continuous monitoring of lake levels when the Jericho River is flowing from Lake C3 (summer only as the River freezes completely in winter) will be used to determine Lake C3 discharge.

In order to provide data for operation of the Stream C1 diversion, this stream will also be gauged at the transition pool 2 (Figure 3) by means of a weir and a continuous height recorder

[1] No endorsement of the equipment shown is implied.

(pressure transducer) once the diversion becomes operational. Use of a calibrated weir at this location will allow direct conversion of water height records to discharge. Prior to construction of the diversion the baseline flow monitoring station will be used as this is the first point above the mouth suitable for water height and flow measurements (Figure 3).

A staff gauge will be installed near the mouth of Stream C3 (JER-WQ3) and will be monitored during Long Lake dewatering and PKCA discharge. Periodic discharge measurements will also be taken.

3.1.7 Receiving Environment Water Quality Monitoring

The objective of the water quality monitoring program will be to the detect changes in water chemistry caused by mining activities. Discharges from the PKCA are predicted to be above CCME Aquatic Life Guidelines and for most parameters above background concentrations in the receiving environment. The site-specific water quality criteria developed for Jericho can be found in Appendix C. Fallout of suspended particulate from blasting could increase ammonia concentrations in water bodies within the mine site as well but the amount of suspended particulate that will enter water bodies from blasting is not expected to measurably affect suspended solids concentrations.

Monitoring stations will be established (a) at two control sites one within the Jericho River drainage basin and one in a separate basin), (b) near to the discharge location for PKCA and (d) in lakes on and adjacent to the mine site and (e) in lakes within the Jericho River at some distance from the mine.

During summer, water will be collected by submersing bottles 0.25 m below the surface in lakes and below the surface in streams, uncapping and allowing bottles to fill, recapping and then resurfacing. Raw water sample bottles will be rinsed three times; other sample bottles will not be rinsed.

During periods of ice cover (i.e., the April and December sampling periods), holes will be drilled through the ice cover by a gas powered ice auger for the collection of surface grab water samples. Samples will be collected approximately 0.5 m below the water surface exposed in the holes. Rinsing of sample containers with in-situ water will be impractical due to the cold weather; consequently, laboratory prepared sample containers will be used.

Dissolved metal samples will be filtered through a 0.45 μm nullipore filter and preserved with AA grade nitric acid. Total metals samples will also be preserved with AA grade nitric acid. Total organic carbon samples will be preserved with AA grade sulphuric acid. A 2-L sample of raw water will not be preserved. All samples will be kept cool during storage and air transported to the analytical laboratory.

Schedule 1 lists the monitoring stations and the frequency of monitoring. Detection limits to be used in laboratory analyses are listed in Table 3-1.

Table 3-1: Water Sample Laboratory Detection Limits

Water Quality Parameter	Detection Limits (mg/L or parameter units)	Water Quality Parameter	Detection Limits (mg/L or parameter units)
Physical Tests		**Total & Dissolved Metals**	
Conductivity (umhos/cm)	2	Cobalt (Co)	0.0001
Hardness $CaCO_3$	0.05	Copper (Cu)	0.0001

Water Quality Parameter	Detection Limits (mg/L or parameter units)	Water Quality Parameter	Detection Limits (mg/L or parameter units)
pH	0.01	Iron (Fe)	0.03
Total Suspended Solids	3	Lead (Pb)	0.00005
Total Dissolved Solids	3	Lithium (Li)	0.001
Dissolved Anions		Magnesium (Mg)	0.05
Alkalinity-Total, bicarbonate $CaCO_3$	1	Manganese (Mn)	0.00005
Chloride Cl	0.5	Mercury (Hg)	0.00005
Sulphate SO_4	1	Molybdenum (Mo)	0.00005
Nutrients		Nickel (Ni)	0.0001
Nitrate (NO_3)	0.005	Phosphorus (P)	0.3
Nitrite (NO_2)	0.002	Potassium (K)	2
Ammonia (NH_3)	0.005	Selenium (Se)	0.001
Total Dissolved Phosphorus	0.001	Silicon (Si)	0.05
Total Phosphorus	0.001	Silver (Ag)	0.00001
Total & Dissolved Metals		Sodium (Na)	2
Aluminum (Al)	0.001	Strontium (Sr)	0.0001
Antimony (Sb)	0.00005	Thallium (Tl)	0.00005
Arsenic (As)	0.0001	Tin (Sn)	0.0001
Barium (Ba)	0.00005	Titanium (Ti)	0.01
Beryllium (Be)	0.0005	Uranium (U)	0.001
Bismuth (Bi)	0.0005	Vanadium (Va)	0.001
Boron (B)	0.001	Zinc (Zn)	0.001
Cadmium (Cd)	0.00005	**Organic Parameters**	
Calcium (Ca)	0.05	Total Organic Carbon (TOC)	0.01
Chromium (Cr)	0.0005	Total Inorganic Carbon (TIC)	0.01

Parameters that will be measured in the field for each station are listed in Table 3-2.

Table 3-2: Field Water Quality Monitoring Parameters

Sampler's name	Field pH
Station number	Water temperature
Single or replicate sample	Dissolved oxygen (where appropriate)
Conductivity	Oxidation Reduction Potential (where appropriate)
Date and time	Water transparency (secci disk) (where appropriate)
Type and number of bottles filled	Any other field measurements, e.g. weather
Sample depth (for depth profiles)	Turbidity (dewatering only)

General water parameters (pH, dissolved anions, nutrients) will be analyzed in accordance with procedures described in "Methods for Chemical Analysis of Water and Wastes" (United States Environmental Protection Agency), "Manual for the Chemical Analysis of Water, Wastewaters, Sediments and Biological Tissues" (British Columbia Ministry of the Environment), and/or

"Standard Methods for the Examination of Water and Wastewater" (American Public Health Association).

Total and dissolved metals and organic parameter samples will be analyzed in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater", 18th Edition (American Public Health Association, 1992). Several methods will be employed for metals analysis, including Inductively Coupled Plasma-Mass Spectrophotometry (ICP-MS) and Atomic Absorption Spectrophotometry (AA) to obtain the required detection limit for each element. Organic parameters will be analyzed using a gas chromatograph - flame ionization detector (GC/FID). Mercury will be analyzed by cold vapour AA.

3.2 Monitoring Activities and Schedules

1. Pursuant to Water Licence Part E, Conditions Applying to Water Use, Section 1, a totalizing meter will be installed at the water intake line at Carat Lake and a log of water use kept for inspection at the Jericho Diamond Mine.

2. Pursuant to Water Licence Schedule L, Conditions Applying to General and Aquatic Effects Monitoring Plans, Section 4dvii, the level of Carat Lake will be monitored at the water intake.

3. Pursuant to Water Licence Part F, Conditions Applying to Water Management, Section 4c, a minimum of weekly inspection of water management structures will be carried out during the open water period. Inspection reports will be filed with the Mine Manager after each inspection and reports maintained for review by a Nunavut Water Board Inspector upon request.

4. Pursuant to Water Licence Part G, Conditions Applying to Waste Management, Section 1, totalizing meters will be installed on:

    a. the main tailings discharge line from the diamond processing plant;
    b. the discharge line from the sewage treatment plant;
    c. the final discharge line from the PKCA;
    d. any other internal pumped discharge lines that may from time to time be required as part of liquid waste management.

    Logs of discharges will be kept for inspection at the Jericho Diamond Mine.

5. Pursuant to Water Licence Part G, Section 2d, a minimum of weekly inspection of waste management structures will be carried out throughout the mining operation period. Inspection reports will be filed with the Mine Manager after each inspection and reports maintained for review by a Nunavut Water Board Inspector upon request.

6. Pursuant to Water Licence Part G, Section 3, a minimum of weekly inspection of earthworks, retention structures, dams and diversion structures, stockpiles, dumps, berms and pit slopes will be carried out throughout the mining operation period. Inspection reports will be filed with the Mine Manager after each inspection and reports maintained for review by a Nunavut Water Board Inspector upon request.

7. Pursuant to Water Licence Part G, Sections 6a, 6b, 7a and 7b all discharges from the PKCA to Stream C3 at monitoring station JER-WQ2 will be analyzed for the parameters listed in Schedule 1. Upon directing discharge from the waste water treatment plant to the PKCA the following additional parameters will be monitored:

a. Biochemical Oxygen Demand
b. Oil and Grease
c. Faecal Coliforms

Acute toxicity will also be monitored before discharge and monthly thereafter using rainbow trout and *Daphnia magna* according to Environmental Protection Series Biological Test Method EPS/1/RM/13 and EPS/1/RM/14, respectively.

8. Pursuant to Water Licence Part H, Conditions Applying to Waste Management Plans, Section 4 during the first year of operation, recovery plant rejects (coarse PK) will be collected once every two weeks. Samples will be submitted for testing of paste pH, reactivity with HCl, and total sulphur. Full ABA analyses, ICP-metals and uranium analyses would be performed on every 10th sample. At the end of the sampling period an analysis report will be prepared and submitted as an addendum to the Waste Rock Management Plan.

9. Pursuant to Water Licence Part K, Conditions Applying to General and Aquatic Effects Monitoring, Section 2, a continuous water height recorder will be installed in Lake C3 near its outlet during the first open water season of the construction period. The recorder will be fitted with a radio link to the control room of the diamond processing plant where data can be monitored in real time if required. The water height recorder will be operated whenever PKCA discharge is occurring. A minimum of three (3) benchmarks will be established on bedrock to allow lake levels to be periodically surveyed in order to calibrate actual lake levels with the recorders readings. A suitable location will be selected in the C3 outlet stream (Jericho River) to measure stream discharge. The stage discharge curve developed for the Final EIS will be upgraded with additional information to allow a relationship between lake water level and lake outlet discharge to be determined. This relationship, coupled with continuous monitoring of lake levels when the Jericho River is flowing from Lake C3 (summer only as the River freezes completely in winter) will be used to determine Lake C3 discharge.

10. Pursuant to Water Licence Part K, Section 4, water quality monitoring will be conducted according to the schedules set out in Schedule 1.

11. Pursuant to Water Licence Part K, Section 12, flows will be measured as per Schedule 1. In addition to flows listed in Schedule 1:

    a. The volume of PKCA reclaim water will be monitored when water is being reclaimed.
    b. The weight of solids in tonnes and volume of liquid fractions in m^3 of each waste pumped to the PKCA.
    c. The volume of sewage sludge removed from the Waste Water Treatment Plant.

12. Pursuant to Water Licence Part K, Section 13, the following quantities produced or stockpiled will be monitored and recorded on a monthly basis:

    a. processed ore;
    b. waste rock;
    c. coarse PK;

d. till and overburden.

13. Pursuant to Water Licence Part L, Conditions Applying to General and Aquatic Effects Monitoring Plans, Section 9, an annual seepage survey will be conducted during summer months. A report will be submitted to NWB within 60 days of completion of the survey.

14. Pursuant to Water Licence Schedule L, Conditions Applying to General and Aquatic Effects Monitoring Plans, Section 1c, the conditions of Stream C3 channel will be monitored during PKCA release as will water levels and discharges near the mouth.

15. Pursuant to Water Licence Schedule L, Section 4 d iv, chronic toxicity tests will be conducted on water collected at the edge of the mixing zone in Lake C3 during the open water season when PKCA discharge is occurring. Environment Canada Biological Test Method EPS /1/RM/21 (1992) will be used.

3.3 Monitoring Summary

3.3.1 Site Water, Ore and Waste

Specific locations at each facility will have to be field fit. The following sites will be monitored:

- Temporary or permanent collection ditches or ponds A, B and C, which will be used as control structures to direct water to the pit sump or PKCA during operations.
- The pit sump.
- The process plant supernatant.
- Treated sewage effluent.
- PKCA pond water.
- PKCA discharge water.

A seepage survey will monitor all seepages from waste and water management structures on the site annually in the summer.

Quantities of ore, waste and till/overburden generated during mining will be recorded.

The following volumes will be monitored:

- Daily intake water volume at the main intake in Carat Lake.
- Volume of water from runoff collection ponds.
- Volume of water reclaimed from the PKCA when water recycling occurs.
- Daily volume of water discharged from the PKCA.
- Daily volume of mine water and seepage pumped from the open pit, ponds and other site water management facilities. (Note: operationally it may not be possible to separate runoff and mine water collected in site water management facilities.)
- Daily volume of treated sewage effluent discharged from the Waste Water Treatment Plant.
- The volume of sewage sludge removed from the Waste Water Treatment Plant.
- The weight of solids and volume of liquids pumped to the PKCA from the diamond processing plant.

3.3.2 Receiving Environment Water Quality and Quantity

All receiving environment water quality and flow monitoring is listed in Schedule 1.

Lake levels will be monitored continuously at the Carat Lake water intake and Lake C3 outlet by means of water level recorders.

The following flows will be monitored:

- Stream C3 near its mouth during PKCA discharge.
- Jericho River at the outlet of Lake C3 during periods of flow (spring-summer-fall).
- Stream C1 at pond 2 (lower energy dissipation pool) after construction of the C1 Diversion and prior to that at the baseline stream flow station upstream when the stream is flowing.

Acute toxicity tests using rainbow trout and *Daphnia magna* will be conducted monthly on PKCA discharge. Chronic toxicity testing will be conducted on *Ceriodaphnia dubia* monthly during the open water season from water collected at the edge of the 200 m mixing zone in Lake C3.

4.0 QA/QC

4.1 Site Water Quality

Standard QA/QC procedures for water sampling including collection of field, travel and method blanks and duplicate samples will be included in the program. Section 4.2 provides additional details on field and laboratory QA/QC.

4.2 Receiving Water Body Water Quality

4.2.1 Field

To check on the precision of the samplers, duplicate water samples will be submitted for testing for some of the samples taken. Sequential duplicate samples will be collected for 10% of the total number of samples per sampling session. A sequential duplicate requires that the collector fill two sampling sets (group of bottles from two different samples at the same depth). Since sampling will take place over three seasons, no spatial bias towards any specific site or temporal bias towards any season will be incorporated into the sampling program. The sampling program will submit blind duplicates for analysis, i.e., duplicate samples not labelled with the location.

To ensure that no contamination had reached the samples, during the process of sampling (field blanks) or introduced from the bottles or preservatives (trip blanks), will be incorporated into the sampling process. A travel/field blank is a set of bottles filled with demineralized-de-ionized water (supplied by the lab) and processed in the same manner as a collected water sample. These blanks will be carried for each sampling session. Trip blanks will have preservative added in the field to bottles filled in the lab with demineralized-de-ionized water. All field blanks will be filled in the field with de-ionized-demineralized water to ensure that they undergo the same conditions and procedures as the water samples (i.e., collection, storage, and travel). A filter blank will be filled with field-filtered de-ionized-demineralized water.

The third level of quality control will be a check on the laboratory's precision and accuracy by preparing a split sample in the field. A split sample is a discrete water sample separated into two identical tests. The water sample is collected at one time and at a specific depth. In theory, the same results should be achieved when analyzed by the lab.

Field instrumentation (DO meter, pH meter, conductivity meter) will be calibrated prior to use. Mercury-in-glass thermometers (for water temperature) are normally very stable and do not need recalibration each time used. Any thermometers with broken columns will be discarded and not used for water temperature determinations.

4.2.2 Laboratory

4.2.2.1 Quality Assurance Management

Laboratory analytical reports contain pertinent information regarding the sample(s) submitted for analyses. This information includes the date the sample was collected and received by the lab, date of analysis, technician's initials, parameters, methodology, method reference, method detection limit and results. The report is reviewed by the lab QA/QC coordinator and lab manager for completeness and accuracy. All documentation associated with the analysis including raw data, chromatograms, calibration curves, calculations, etc. are kept in that file.

4.2.2.2 Quality Objectives

- To assure a Quality System that is documented and incorporates adequate review, audit and internal quality control.

- To assure personnel are adequately supervised and are proficient to carry out assigned activities.
- To assure test methods and related procedures are validated and incorporate adequate quality control.
- To assure all equipment, supplies and services are functioning properly and/or meet required specifications.
- To assure that facilities are adequate to carry out the testing activity.
- To assure sample management procedures that incorporate adequate procedures for the security, receipt, identification, checking, routing, storage and disposal of all samples.
- To assure data management procedures that incorporate adequate procedures for the security, recording, calculation, validation, authorization, transmittal, storage and disposal of all test data and related records.
- To assure workload management procedures that incorporate acceptable turnaround time and verification of resource availability prior to the acceptance of additional testing.

4.2.2.3 Sample Containers and Preservatives

The lab will utilize the list of recommended containers, preservation techniques and holding times published by USEPA to guide project managers and clients in making the correct choices for particular samples. All sample containers used by the chemistry laboratory will be purchased as pre-cleaned according to EPA protocol. Upon request, the chemistry laboratory supplies the necessary sampling containers with the required preservatives and sampling instructions. All samples submitted to the lab will be kept at 4°C until the time of analysis and they are analyzed within the maximum holding time.

4.2.2.4 Chain of Custody

It is necessary for each sample or group of samples to be accompanied by a chain-of-custody record from the time of sampling in order to trace possession. The record will contain the following information:

- Name of client.
- Project name or sampling address.
- Sample ID.
- Date and time of collection.
- Size of sample containers.
- Analysis required.
- Signature of all individuals involved in the chain of possession.
- Inclusive dates of possession.

4.2.2.5 Sample Hold Time

United States Environmental Agency and many other regulatory agencies have established holding times for most analytical parameters. Quality data requires that analyses be performed within the specified holding times. The assay laboratory will notify the project manager of any expired holding times prior to proceeding with the analysis.

4.2.2.6 Trip Blanks

Trip blanks are part of the field QA. Many types of blanks are available to the analyst including field, trip and laboratory reagent blanks. All sets of analyses are accompanied by at least reagent blank. The analysis of this blank is performed to identify potential sources of interferences from glassware, reagents and instrumentation. Blank corrections are not performed, but the blank values above the detection limit are noted and reported in the report.

4.2.2.7 Field Blanks

Field blanks are part of the field QA. The laboratory will provide support to field sampling crews by recommending and supplying quality Class 1 U.S.-EPA pre-cleaned containers, as well as the required preservatives, coolers and refrigerants. Field personnel will be reminded by the lab are to supply the appropriate number of field blanks and duplicates. Distilled and de ionized water for field and trip blanks will be provided upon request. Blank corrections are not performed, but the blank values above the detection limit are noted and reported in the report.

4.2.2.8 Surrogate Standards and Internal Standards

Surrogates are compounds not normally found in the environment but respond to analysis in a manner similar to the compound of interest. Surrogate spike recoveries are used to determine the accuracy of the analysis. The results form surrogate analyses are used in a manner similar to check samples including control charts of expected recoveries. Any analyses with values outside the action limits are re-analyzed and checks are made for calculation and preparation errors.

4.2.2.9 Instrument Calibrations

Instruments are calibrated prior to analyses using a series of high-purity standards that cover the working range of the instrument. Instrument responses are collated in an appropriate quality control sheet and this data is plotted regularly to monitor for inappropriate changes.

4.2.2.10 Calibration Check Standards & Drift Control Standards

When the instrument is not running continuously, a check calibration standard is analyzed at the end of an analytical run. A check calibration standard is a mid-range standard that is analyzed as an unknown. The calibration check standard is reviewed and its response is compared with the response for the beginning standards. If the response for the check calibration standard differs from the response for the beginning standards by more than 15 percent, corrective action must be taken.

4.2.2.11 Field Duplicates

Field duplicates are part of field QA. Field duplicates will be included by the field samplers at a rate of 10% of the number of samples.

4.2.2.12 Replicate analysis

Duplicate analysis is performed on every tenth sample submitted to the lab. Projects, with a large number of samples submitted as one lot, are automatically assigned replicates at a rate of 1 in 10 samples (10%). The results from replicate analyses are normally submitted as a separate set of reports.

4.2.2.13 Standard Reference Material (SRM) and Matrix Spikes

Standard reference materials (SRM's), if available, will be run concurrently with sample analyses. A QC report will accompany reports providing details of lab results versus the SRM certified value and advisory ranges.

Matrix spikes will be analyzed to determine the effect of the sample matrix on the analyte of interest. Spikes are usually performed on the same sample analyzed in duplicate when required. They are performed when the analyst suspects potential matrix interference or when specifically requested by the client.

4.2.2.14 Method Blanks

With every batch of samples, a method blank will be prepared with deionized water and/or extraction solvent and is analyzed to verify the absence of interferences or contaminants associated with storage, preparation and instrumental analyses.

4.2.2.15 Control Charts

Analysts will report the results from the SRM's onto control charts. The control charts are used to document the statistical control of the measurement process and to determine the limits of acceptable data. Control charts are prepared from surrogate standard values and spike values on an ongoing basis but entered daily. A minimum of 30 points are used in preparing each control chart. It is the responsibility of the appropriate analyst to prepare the control charts pertaining to his/her analyses and to refer to those charts regularly. Warning limits are set at +2 and -2 standard deviations from the mean and action limits are set at +3 and -3 deviations from the mean. The charts are reviewed regularly by the QA/QC Manager.

4.2.2.16 Inter-laboratory Comparisons

A Canadian Association for Environmental Analytical Laboratories (CAEAL) Inc. will be used for analyses. It should be noted that for continuity over what is expected to be a long term monitoring program, the same laboratory will be used year after year.

4.3 Lake Levels

Water height recorders will be factory calibrated before installation. Readings from water height recorders will be periodically checked as previously discussed. A minimum of three (3) benchmarks will be established on bedrock near the water height recorder locations to allow water levels to be periodically surveyed in order to calibrate actual water levels with the recorders readings.

4.4 Stream Flows

In-stream current meters are factory calibrated when new. They require periodic recalibration. This is accomplished in a towing tank. A number of facilities exist in Canada and calibration of the instruments used at Jericho would be undertaken at a minimum frequency of every two years during winter months when the flow meters are not employed.

4.5 In-Pipe Totalizing Flow Meters

Several types of meters are available and appropriate meters will be chosen for the specific application at Jericho. All such meters are factory-calibrated and do not require re-calibration in normal use.

5.0 REPORTING AND DATA ANALYSIS

5.1 Data Analysis

All raw abiotic and biotic data collected as part of the monitoring plan will be stored into a common database. The determination of an effect, whether that be abiotic or biotic, will be identified through a rigorous data analysis exercise. All parametric data analysis will be accompanied by appropriate QA/QC to ensure the fundamental assumptions of the analysis of variance (ANOVA) are not violated. Transformation of the raw data may be necessary. Initially, the analysis of the data will focus on a geographic comparison between upstream distant controls, proximal stations and distal downstream locations. Eventually as data is accumulated during the construction phase, temporal trends will be evaluated and comparisons with baseline data would become important.

The monitoring program is designed for comparison among sampling stations, rather than water bodies or watersheds. Monitoring of the abiotic environment will occur at the same locations over time, thus should statistically be treated as a repeated measures analysis of variance. Variance of a given abiotic parameter will occur in space (among stations) and in time. In order to distinguish between these two potential sources of variance, the analysis of variance model, designed to test for spatial effects (among station variance), will consider each of these factors and the potential interaction between these two factors.

The analysis of the temporal trend will proceed through a stepwise process initiated by simple charting over time of the parameter concentrations at each station. To quantitatively investigate suspected temporal trends, the logical statistical tool is regression analysis. If a parameter of potential concern is indicating an increasing (or decreasing) trend a regression analysis will be conducted across time. To determine whether or not the trend differs from those at other stations, either up gradient or down gradient, a statistical test to investigate the differences in slopes will be performed (analysis of covariance).

5.1.1 Site Monitoring

Standard measures of central tendency (mean or median, standard deviation) will be calculated for each data set. Trend analyses will be performed annually on data exhibiting trends. The focus of site water chemistry monitoring is to determine the sources of potentially problematic parameters. The proposed statistical analyses will allow this determination.

Site thermal monitoring data will undergo the same statistical analyses for the same purpose.

Certain monitoring data (e.g. volume of water use, volume of water pumped from collection facilities, volume of recycled water) only require totalizing.

PKCA discharge volume will be compared to Lake C3 discharge to determine theoretical dilution factors for discharge water.

5.1.2 Receiving Environment

5.1.2.1 Stream C3 Discharge

Stream C3 discharge during Long Lake dewatering will be monitored periodically and compared to the natural hydrograph developed as part of baseline studies. The purpose will be to mirror as much as possible, the natural hydrograph of Stream C3 during pump out of Long Lake.

5.1.2.2 Jericho River Discharge from Lake C3

Development of a stage-discharge relationship from continuous measurement of lake water levels and periodic measurement of river discharge were previously discussed.

5.1.2.3 Stream C1 Discharge

Seasonal variation in the natural Stream C1 discharge will be determined by plotting the periodic discharge measurements made before installation of the weir. These data will be compared with the baseline data collected for the Jericho EIS to build on the database. Once the diversion is completed, the measuring point for Stream C1 discharge will be moved as previously discussed. Seasonal variation in discharge through the diversion will then be compared to the background data collected during baseline studies and during early mine operations to determine whether a significant drop in water discharge has occurred. Any contact water in the Stream C1 drainage basin that meets discharge criteria could be discharged to the stream pursuant to regulatory approval, thus increasing stream flows.

5.1.2.4 Carat Lake Water Level

Carat Lake level will be continuously monitored at the water intake. An estimate of the drawdown of the lake, if measurable, will be determined from the data. Since there are no background data on Carat Lake water level seasonal variations, the lake level records will be compared to lake bathymetry to determine the percentage of total lake water volume drawn off for mine use.

5.1.2.5 Water Chemistry

Water chemistry data analyses will include:

- Within sample variation at each site using measures of central tendency (range, mean or median, standard deviation).

- Spatial variability in parameters controlled by the project water licence.

- Spatial trends quantitative analysis: To test whether there is any difference among stations a repeated measures factorial analysis of variance (ANOVA) test will be performed with normalized data for parameters controlled by the project water licence for Stations within the Jericho River (Control, C3, Carat, Jericho Lakes and Jericho River downstream of Jericho Lake).

- Qualitative temporal trends will be evaluated using time series charts. Quantitative temporal trends, as required, will be investigated with regression analysis and determinations of differences among slopes (analysis of covariance).

- Quantitative temporal trends among sites on the Jericho drainage using ANOVA. Again, an increase in metals coupled with biological effects will trigger adaptive management.

5.2 Reporting

Reporting requirements of the Jericho Water Licence with respect to general monitoring activities are discussed in this section. The format of the Water Licence is again followed for ease of reference to the Licence.

1. Pursuant to Water Licence Part B, Section 6, all reports will be submitted as three paper copies and one electronic copy.

2. Pursuant to Water Licence Part F, Section 4c, inspection records of all water management engineered structures will be kept by the Mine Manager for inspection by a NWB Inspector.

3. Pursuant to Water Licence Part F, Section 4e, independent geotechnical engineer's reports will be submitted to the NWB within sixty days of completion of the inspection.

4. Pursuant to Water Licence Part G, Section 2d, inspection records of all waste management structures will be kept by the Mine Manager for inspection by a NWB Inspector.

5. Pursuant to Water Licence Part G, Section 2g, independent geotechnical engineer's report will be submitted to the NWB within sixty days of completion of the inspection.

6. Pursuant to Water Licence Part H, Section 4, a report identifying the characteristics of the recovery plant rejects and plans for management will be submitted after the first year of operation.

7. Pursuant to Water Licence Part L, Section 9, the annual seepage survey report will be submitted to the NWB within 60 days of the completion of the survey.

8. Pursuant to Water Licence Part L, Section 14, all data and information from surveys will be submitted to NWB in electronic and printed format including the results of the QA/QC program.

9. Pursuant to Water Licence Part M, Section 7, an annual report will be submitted by 31 March for the preceding year, including an updated estimate of the total mine closure restoration liability using the current version of RECLAIM, or equivalent.

Reporting of spills or other extra-ordinary events is not listed here, nor is any other occasional reporting requirements as set out in the Jericho Water Licence.

For ease of reference, reporting requirements of the Jericho Water Licence are summarized in Table 5-1.

Table 5-1: Jericho Water Licence Reporting Requirements Summary

Report	Water Licence Reference	Frequency	Due Date
Inspection reports, water management facilities	Part F, 4c	Weekly or more frequently	On file for review by NWB
Inspection reports, waste management facilities	Part G, 2d	Weekly or more frequently	On file for review by NWB

Report	Water Licence Reference	Frequency	Due Date
Independent geotechnical engineer's reports • PKCA dams • Ponds • Waste rock dumps • Stockpiles • Landfarm • Landfill • Fuel farm	Part F, 4e; Part G, 2g	Annual	Within 60 days of inspection
Recovery plant rejects characterization	Part H, 4	Once	1 year after operation begins
Seepage survey report	Part L, 9	Annual	Within 60 days of survey
Data and information from surveys	Part L, 14	As collected	To NWB as collected in paper and electronic form
Update of reclamation liabilities	Part M, 7	Annual	March 31 of the following year

6.0 TRIGGERS FOR ACTION

6.1 Site Monitoring

No water exceeding Water Licence criteria will be discharged to the environment. Contact water not meeting criteria will be pumped to the PKCA.

Geotechnical stability issues will be dealt with on a case by case basis with appropriate action to re-establish stability.

6.2 Receiving Environment Water Chemistry

In general exposure site exceedance of site-specific water quality guidelines outside of the initial dilution zone will be a trigger for action. Increases mirrored at control sites and reasonably ascribable to natural causes will not trigger remedial action. The management strategy will be to first isolate the probable cause(s). Should the probable cause be PKCA discharge, management strategies discussed in the Water Licence application include alternate treatment methods for PKCA supernatant water such as increased storage time, spray irrigation (when approved) and controlled phosphate addition to the PKCA. If the source is other than PKCA discharge, appropriate action will be instituted to eliminate or adequately control discharge from the source.

6.3 Toxicity Testing

Failure of acute toxicity tests will trigger cessation of discharge until acute toxicity tests again pass. Failure of chronic toxicity tests will trigger an investigation of water chemistry, Lake C3 outflows and any other parameters that are appropriate to determine the possible cause. Chronic toxicity tests are to be performed on a monthly basis and take 21 days to complete; thus a failed test would be routinely followed by another test, except at the end of the season when PKCA discharge ceases.

REFERENCES

American Public Health Association. 1992. Examination of Water and Wastewater", 18th Edition.

Mainstream Aquatics. 2004. Jericho Diamond Project. Aquatics Effects Monitoring Program.

SRK Consulting. 2004. Technical Memorandum M. Waste Rock, Overburden, Low Grade Ore and Coarse Kimberlite Management Plan. Jericho Project, Nunavut.

SCHEDULE 1

Water Quality Monitoring Schedules

Table 1 – Water Quality Parameters

Test Group	Analytical Parameters	Measurement Units
Routine – R	Alkalinity, acidity, chloride, carbonate, bicarbonate, total hardness, hydroxide, sulphate, total suspended solids (TSS), total dissolved solids (TDS), total organic carbon (TOC), total inorganic carbon (TIC) pH (field and lab) ORP (field) Conductivity (field and lab) Temperature (field) Turbidity	mg/L pH units mV µS/cm °C NTU
Metals (Total – unfiltered) – MT and Metals (Dissolved – filtered) – MD	T- Aluminum T – Arsenic T- Cadmium T – Chromium T – Copper T – Lead T – Molybdenum T – Nickel T – Uranium T – Zinc D - Aluminum	mg/L
ICP-T, ICP-D; ICP Metals Scan (Total and dissolved) to include	Ca, Mg, Na, K, Al, As, Ba, B, Be, Cd, Cr, Co, Cu, Fe, Hg, Pb, Mn, Mo, Ni, Se, Sr, U, V, Zn	mg/L
Nutrients – N	Total Ammonia – N, Nitrate – N, Nitrite – N Total Phosphorus, orthophosphorus	mg N/L mg/L
Biological – B	Biochemical Oxygen Demand Fecal Coliform	mg/L CFU/100 mL
Potable Water – PW	Fecal Coliform ICP metals (Total and dissolved) TSS	CFU/100 mL mg/L mg/L
Dissolved Oxygen Profile – DO		

Table 2 – Receiving Environment Water Quality Monitoring Requirements[1]

Station	Location	Phase	Test Group	Freq	Flow	Freq
JER-WQ1	Carat Lake – Freshwater Intake	Operation	PW	M2	m^3/day	C
JER-WQ2	PKCA Discharge	Construction	Turbidity (correlated with TSS)	D	m^3/day	D
		Operation	R, ICP-T, ICP-D, N B	W M2	m^3/day	C
JER-WQ3	Stream C3 upstream of Lake C3	Pre-construction[a]	R, ICP-T, ICP-D, N	M2		
		Construction	R, ICP-T, ICP-D, N	M2		
		Operation	R, ICP-T, ICP-D, N	M2		
JER-WQ4	Lake C3 South Basin	Pre-construction	R, ICP-T, ICP-D, N DO	A1		
		Construction	R, ICP-T, ICP-D, N	M1		
		Operation	R, ICP-T, ICP-D, N	M1		
JER-WQ5	Lake C3 Outlet	Pre-construction			m^3	C[b]
		Construction	R, ICP-T, ICP-D, N	M2	m^3	C
		Operation	R, ICP-T, ICP-D, N	M2	m^3	C
JER-WQ6	Carat Lake Centre Basin	Pre-construction	DO	A1		
		Construction	R, ICP-T, ICP-D, N	M1		
		Operation	R, ICP-T, ICP-D, N	M1		
JER-WQ7	Carat Lake Outlet	Construction	R, ICP-T, ICP-D, N	M2		
		Operation	R, ICP-T, ICP-D, N	M2		
JER-WQ8	Jericho Lake North Basin	Pre-construction	R, ICP-T, ICP-D, N, DO	A1		
		Construction	R, ICP-T, ICP-D, N	M1		
		Operation	R, ICP-T, ICP-D, N	M1		
JER-WQ9	Jericho River Downstream of Jericho Lake	Construction	R, ICP-T, ICP-D, N	M1		
		Operation	R, ICP-T, ICP-D, N	M1		
JER-WQ10	Control Lake	Construction	R, ICP-T, ICP-D, N	M1		
		Operation	R, ICP-T, ICP-D, N	M1		
JER-WQ11	Cigar Lake (2nd Control Lake)	Construction	R, ICP-T, ICP-D, N	M1		
		Operation	R, ICP-T, ICP-D, N	M1		
JER-WQ12	Stream C1 Upstream of Carat Lake[c]	Construction	R, ICP-T, ICP-D, N	M2	m^3	CS
		Operation	R, ICP-T, ICP-D, N	M2	m^3	CS
JER-WQ13	Lake C1	Pre-construction	R, ICP-T, ICP-D, N, DO	A1		
		Construction	R, ICP-T, ICP-D, N	M1		
		Operation	R, ICP-T, ICP-D, N	M1		
JER-WQ14	Lake C4[d]	Pre-construction	R, ICP-T, ICP-D, N, DO	A1		
		Construction	R, ICP-T, ICP-D, N	M2		
		Operation	R, ICP-T, ICP-D, N	M2		
JER-WQ15	Stream C4 upstream of Carat Lake	Construction	R, ICP-T, ICP-D, N	M2		
		Operation	R, ICP-T, ICP-D, N	M2		
JER-WQ16	Lynne Lake	Operation	R, ICP-T, ICP-D, N	A2		

1 A1: Annual once in winter
A2: Annual once in summer
M1: Monthly; mid Apr, Jun, Jul, Aug, Sept, Dec
M2: Monthly; once during Jun, Jul, Aug, Sep
PW: Potable Water
W: Weekly D: Daily C: Continuous CS: Continuous Seasonal

Station	Location	Phase	Test Group	Freq	Flow	Freq
JER-WQ17	Key lake	Operation	R, ICP-T, ICP-D, N	A2		
JER-WQ18	Ash Lake	Operation	R, ICP-T, ICP-D, N	A2		

Notes

[a] Pre-construction will occur in the winter and Stream C3 does not flow in the winter as stated in the Jericho Final EIS. Sampling will be conducted as soon as flows commence the first spring during construction.

[b] Jericho River at the outlet of Lake C3 does not flow in the winter and therefore cannot be measured, as stated in the Jericho Final EIS. Lake C3 water levels will not change throughout the winter period, although it will be possible to record water levels continuously throughout the winter.

[c] The flow monitoring location for Stream C1 once the diversion is constructed (Year 3) is pool 2. Prior to construction the monitoring location will be upstream at the baseline monitoring site for the stream to provide continuity with background flow data. As well, the lower stream is braided and not suitable for flow measurement.

[d] Lake C4 freezes completely to the bottom in winter, as stated in the Jericho Final EIS. Therefore no water can be collected during pre-construction or until the ice melts (typically in May or early June. Water cannot be collected on the M1 schedule since the lake is complete frozen in mid April and mid December. Water will be collected on the M2 schedule.

Locations are shown on Figure 1.

[1] A1: Annual once in winter
A2: Annual once in summer

M1: Monthly; mid Apr, Jun, Jul, Aug, Sept, Dec
M2: Monthly; once during Jun, Jul, Aug, Sep

PW: Potable Water

W: Weekly

D: Daily

C: Continuous

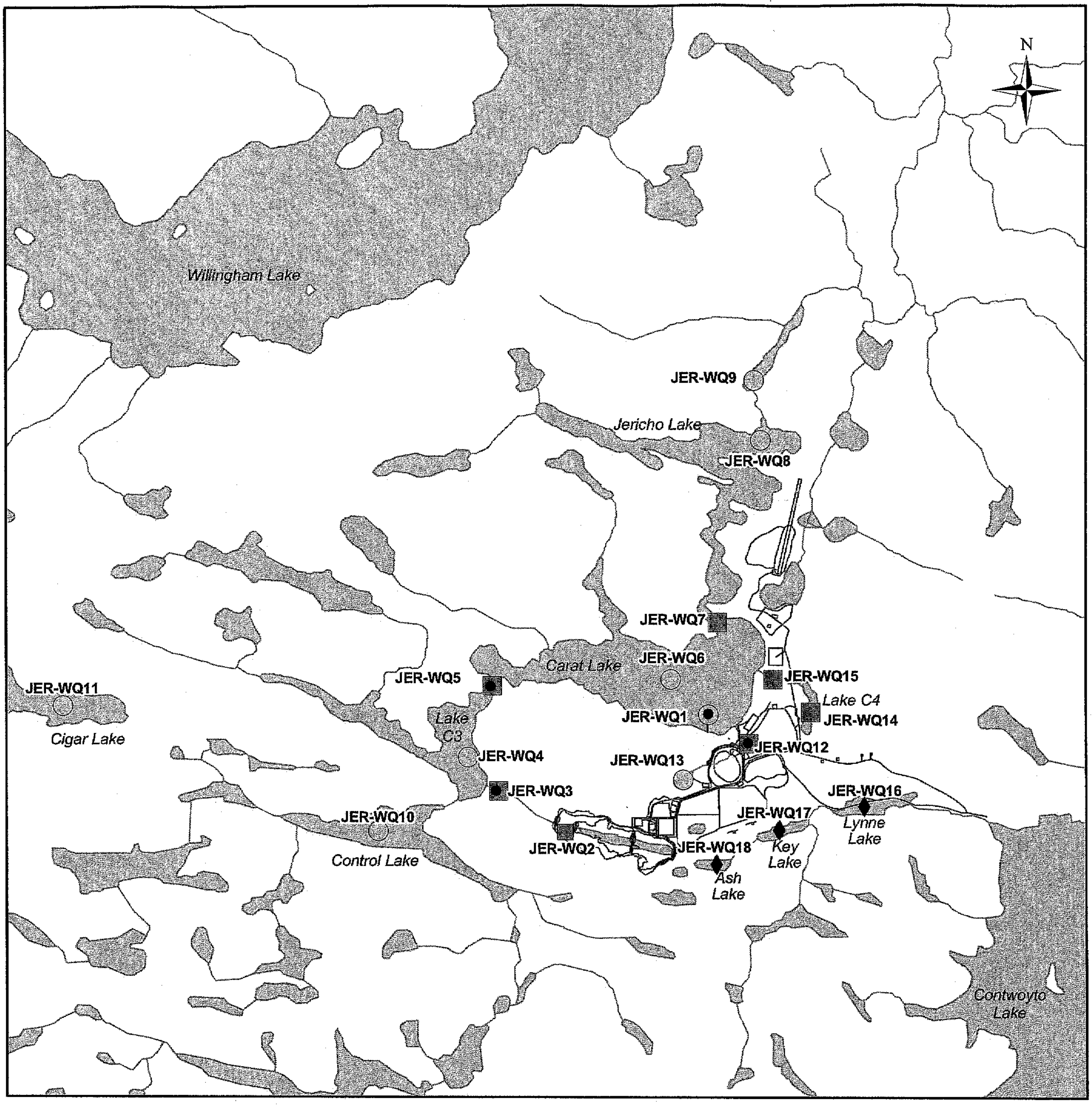
CS: Continuous Seasonal

Table 3 – Site Water Quality and Thermal Monitoring Stations[2]

Station	Location	Phase	Test Group	Freq	Flow	Freq
JER-SW1	Sewage Treatment Plant Effluent	Construction	R, ICP-T, ICP-D, N, B	M	m^3	C
		Operation	R, ICP-T, ICP-D, N, B	M	m^3	C
JER-SW2	Open Pit	Construction	R, ICP-T, ICP-D, N	M	m^3	C
		Operation	R, ICP-T, ICP-D, N	M	m^3	C
JER-SW3	Process Plant Supernatant	Construction	R, ICP-T, ICP-D, N	M	m^3	C
		Operation	R, ICP-T, ICP-D, N	M	m^3	C
JER-SW4	PKCA Pond Water	Construction	R, ICP-T, ICP-D, N	M		
		Operation	R, ICP-T, ICP-D, N	M		
JER-SW5	Temporary/permanent Collection Ditches	Construction	R, ICP-T, ICP-D, N	M3		
		Operation	R, ICP-T, ICP-D, N	M3		
JER-SW6	Collection Pond A	When in Use	R, ICP-T, ICP-D, N	M2	m^3	
JER-SW7	Collection Pond B	When in Use	R, ICP-T, ICP-D, N	M2	m^3	
JER-SW8	Collection Pond C	When in Use	R, ICP-T, ICP-D, N	M2	m^3	
JER-SW9	Rock Dump 1 Seepage	Operation	R, ICP-T, ICP-D, N	A3		
JER-SW10	Rock Dump 2 Seepage	Operation	R, ICP-T, ICP-D, N	A3		
JER-SW11	Coarse PK Stockpile	Operation	R, ICP-T, ICP-D, N	A3		
JER-SW12	Ore Stockpile	Operation	R, ICP-T, ICP-D, N	A3		
JER-SW13	Low Grade Ore Stockpile	Operation	R, ICP-T, ICP-D, N	A3		
JER-SW14	Recovery Plant Rejects	Operation	R, ICP-T, ICP-D, N	A3		
	West Dam Thermistor 1	Upon Installation	Temperature	M		
	West Dam Thermistor 2	Upon Installation	Temperature	M		
	East Dam Thermistor 1	Upon Installation	Temperature	M		
	East Dam Thermistor 2	Upon Installation	Temperature	M		
	Southeast Dam Thermistor 1	Upon Installation	Temperature	M		
	Southeast Dam Thermistor 2	Upon Installation	Temperature	M		
	Waste Dump 1 Thermistor 1	Upon Installation	Temperature	M		
	Waste Dump 1 Thermistor 2	Upon Installation	Temperature	M		
	Waste Dump 2 Thermistor 1	Upon Installation	Temperature	M		
	Waste Dump 2 Thermistor 2	Upon Installation	Temperature	M		
	Coarse PK Stockpile Thermistor 1	Upon Installation	Temperature	M		
	Coarse PK Stockpile Thermistor 2	Upon Installation	Temperature	M		

Approximate locations are shown on Figure 2.

[2] A3: Annual during seepage survey
M: Monthly
M1: Monthly; mid Apr, Jun, Jul, Aug, Sep, Dec
M2: Monthly once during Jun, Jul, Aug, Sep
M3: during periods of flow
W: Weekly D: Daily C: Continuous CS: Continuous Seasonal



Legend

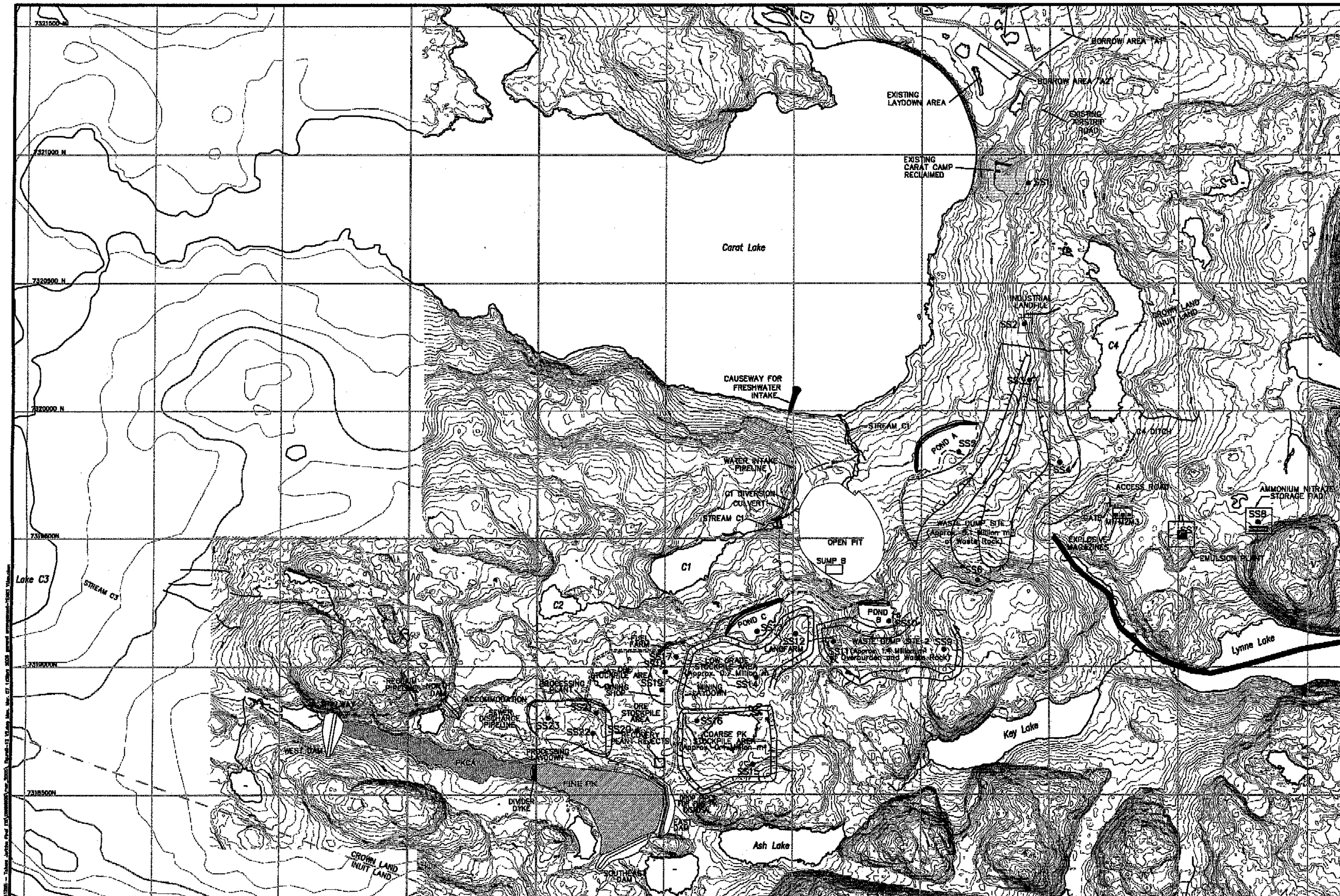
- Year Round Water Quality
- Summer Only Water Quality
- Once Per Summer
- Flow Monitoring - Open Water

Scale: 1:75,000

1 0.5 0 1 2
Kilometres

CLIENT: Tahera Diamond Corporation	
PROJECT: Jericho Diamond Mine	
Receiving Environment Water Quality and Flow Monitoring Sites	
DATE: March 18, 2005	ANALYST: KKQ	Figure 1
JOB No: VE51295-1000	QA/QC: KKQ	PDF FILE: VE51295_Figure1.pdf
GIS FILE: Figure 1 Water Quality SitesV2.mxd		amec
PROJECTION: UTM Zone 12	DATUM: NAD27	

Path: Y:\GIS\...ts\VE\VE51295_JerichoMapping\AEP



LEGEND

- EXISTING ROAD
- EXISTING ROAD (APPROXIMATE LOCATION)
- ROAD REQUIRED BY YEAR 3
- WINTER ROAD
- FRESH WATER PIPELINE
- MINE WATER PIPELINE
- FINE PK DISCHARGE PIPELINE
- RECLAIM PIPELINE
- SEWER PIPELINE
- PKCA DISCHARGE PIPELINE
- DITCH
- SS1 SOIL SAMPLE LOCATION

NOTES:

1. LAYOUTS ARE APPROXIMATE AND MAY NOT REFLECT ACTUAL SIZE AND FOOTPRINT LOCATIONS
2. SHOULD THE GRADE OF THE LOW GRADE MATERIAL BE FAVORABLE, THIS MATERIAL MAY GET PROCESSED WHICH WOULD LEAD TO A REDUCTION IN THE SIZE OF THE STOCKPILE
3. THE TIMING OF THE CONSTRUCTION AT THE NORTH DAM, AND THE COMPLETION OF THE EAST AND SOUTHEAST DAMS WILL BE REVIEWED ANNUALLY UNTIL THE DAMS ARE CONSTRUCTED OR OPERATIONS CEASE.
4. THE TIMING OF THE CONSTRUCTION OF POND B WILL BE REVIEWED ANNUALLY.
5. STOCKPILE FOR CENTRAL AND NORTH KIMBERLITE LOBES SHOW MAXIMUM LIMITS. ACTUAL FOOTPRINTS MAY VARY.

TAHERA CORPORATION
JERICHO LAKE SOUTHWEST EXTENSION

Date of Photography: August 5, 1995.
Scale of Photography: 1:10 000
Survey control supplied by: Conomers Geological Ltd.
Survey control based on: UTM Projection, NAD 27, Zone 12
Compiled by The ORTHOSHOP, Calgary, October 1995.
WO 7423

SOURCE: SRK CONSULTING

0m 10 20 30 40 50 60
1:1500

REV	D	M	Y	ISSUE/REVISION DESCRIPTION	ENG.	APPR.

AMEC Earth & Environmental
2227 Douglas Road
Burnaby, B.C.
V5C 5A9
Tel. 294-3811
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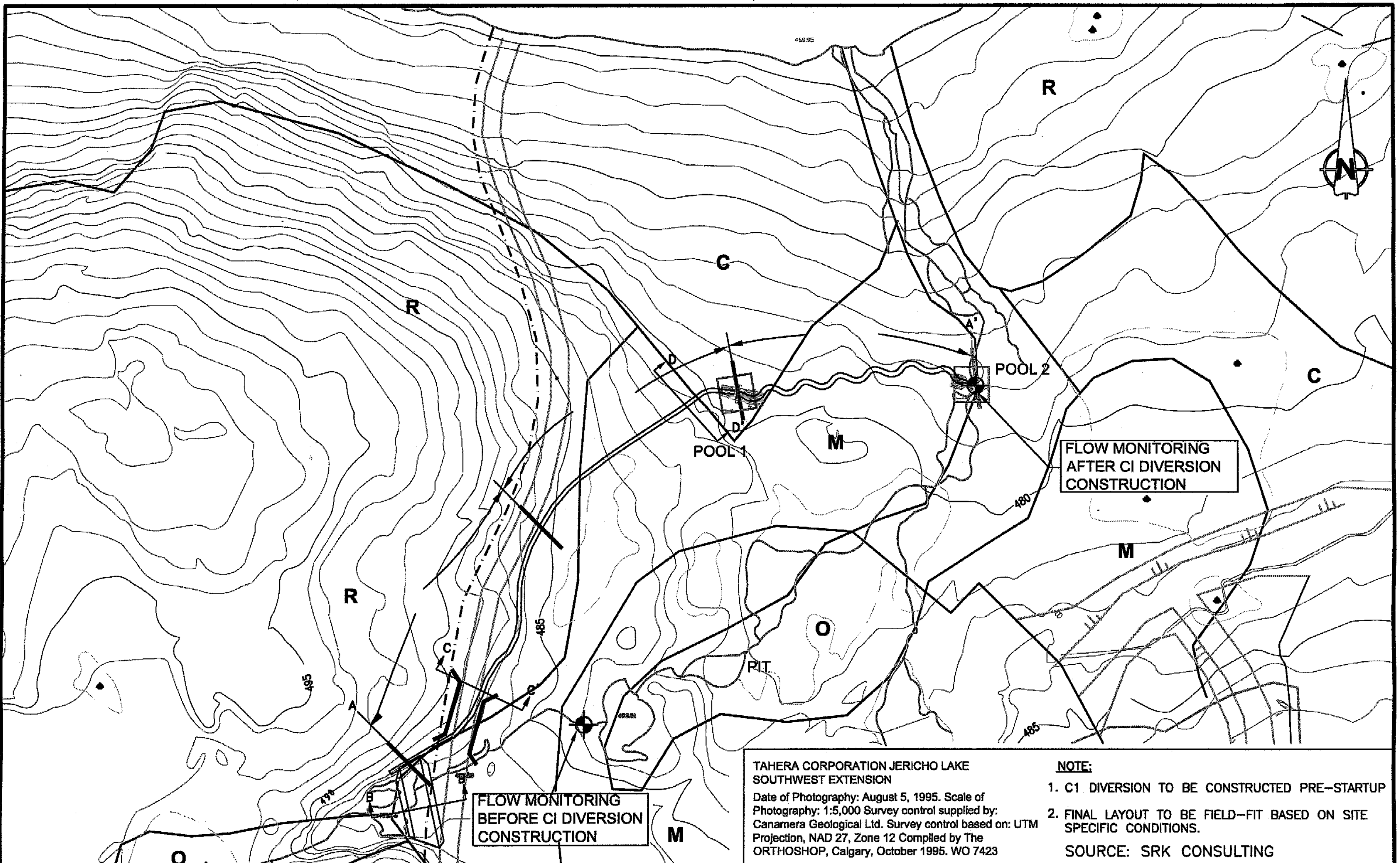
Client: Tahera Diamond Corporation

Designed By: BO	Project: JERICO DIAMOND PROJECT		Project No.: VE51295-1000
Drawn By: YC			CADD File:
Checked By: BO	Title: SITE MONITORING LOCATION MAP		Date: MARCH 2005
Reviewed by: BO			Drawing No.:
Scale: AS SHOWN			Figure No.: Figure 2



TAHERA CORPORATION JERICHO LAKE SOUTHWEST EXTENSION

Date of Photography: August 5, 1995. Scale of Photography: 1:5,000 Survey control supplied by: Canamera Geological Ltd. Survey control based on: UTM Projection, NAD 27, Zone 12 Compiled by The ORTHOSHOP, Calgary, October 1995. WO 7423

NOTE:

1. C1 DIVERSION TO BE CONSTRUCTED PRE-STARTUP
2. FINAL LAYOUT TO BE FIELD-FIT BASED ON SITE SPECIFIC CONDITIONS.

SOURCE: SRK CONSULTING

amec

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Client: Tahera Diamond Corporation

DWN BY:	YC
CHK'D BY:	BO
APP.	BO
SCALE	1:3000

JERICHO DIAMOND MINE

C1 DIVERSION PLAN AND CROSS SECTION

DATE:	MAR. 2005
PROJECT NO:	VE51295
REV. NO.:	-
FIGURE No.	Figure 3