Tahera Diamond Corporation

JERICHO PROJECT
PROCESSED KIMBERLITE MANAGEMENT PLAN

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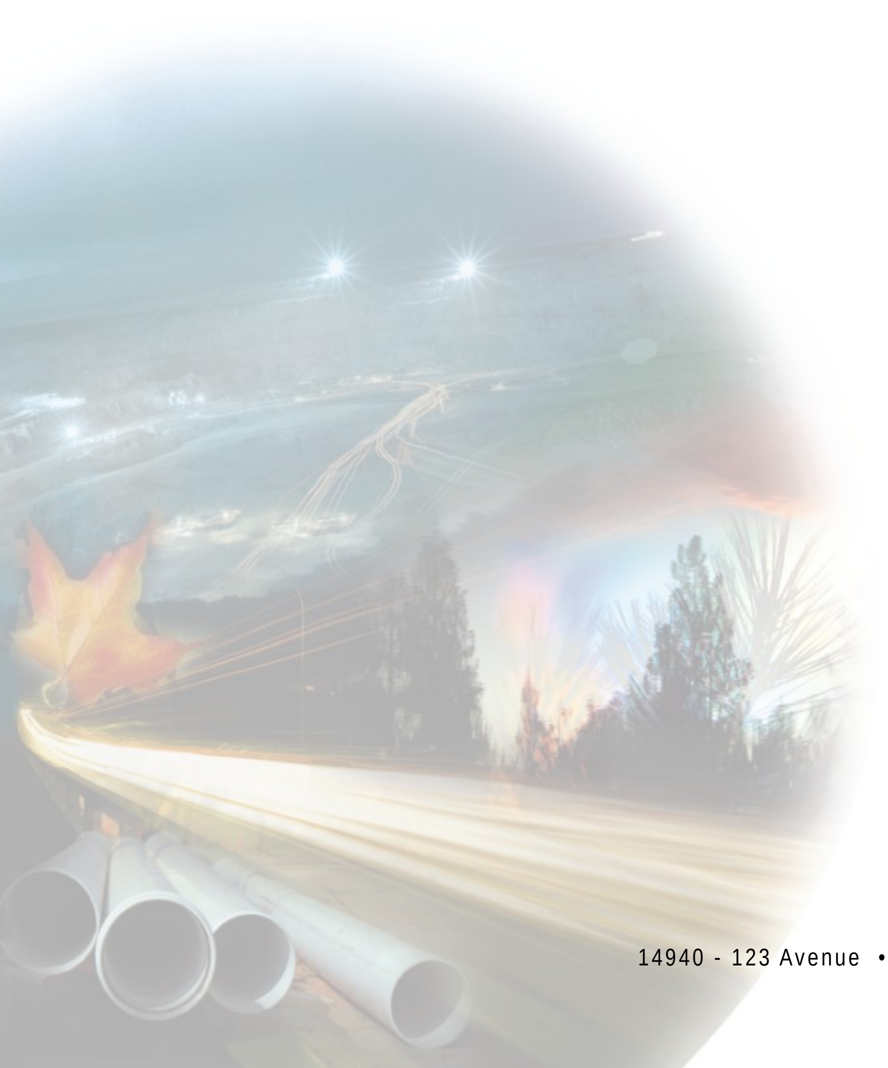

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1.0 INTRODUCTION

Tahera Diamond Corporation (Tahera) is presently developing the Jericho Diamond Mine, Nunavut, located approximately 420 km northeast of Yellowknife. The mine will produce crushed kimberlite as a by-product of the diamond extraction process. Crushed kimberlite is separated into "coarse processed kimberlite" (coarse PK) and a fine processed kimberlite (fine PK). The coarse PK will be placed in stockpiles as described in the Waste Rock Management Plan (SRK, 2006). The fine PK will be deposited in a small lake basin adjacent to the process plant. The fine PK and supernatant water will be contained by the natural topography and low head dams that form the Processed Kimberlite Containment Area (PKCA).

This document has been prepared as a management tool and to fulfil the requirements of the Jericho Mine Water License (NWB1JER0410), Part H - Item 1, Schedule H - Item 1, Part D – Item 5, and Schedule D – Item 5 of the water license. This document is intended primarily for use by Tahera and its designated contractors to ensure that appropriate management procedures are followed during construction and operation of the mine and the appropriate information is obtained for mine closure planning.

The plan includes the following:

- Design criteria for the fine PK and PKCA,
- Stage-Volume curves and water, solids and ice balance calculations showing the life expectancy of the PKCA Facility,
- Water and supernatant water management within the PKCA,
- A summary of fine PK and water containment structures for the PKCA and a construction schedule for the PKCA infrastructure,
- Monitoring requirements for the performance of the PKCA,
- A description of the use of the flocculant and coagulants in the treatment process and controls for its use,
- A description of how discharge rates will be managed to ensure a minimum 10:1 dilution ratio at the edge of the mixing zone in Lake C3,
- Operational and/or structural modifications and contingency components, which may be implemented that affect the management of the PKCA.

1.1 BACKGROUND

1.1.1 Supporting Documentation

The design of the PKCA and supporting information was originally prepared as part of the water licence application to the Nunavut Water Board. The following lists the pertinent documents prepared for the water licence application.

- Design of the Process Kimberlite Containment Area – Technical Memorandum P, August 2004, prepared by SRK Consulting (Canada) Inc.
- Site Water Management, August 2004 – Technical Memorandum W, August 2004, prepared by SRK Consulting (Canada) Inc.
- Estimates of Receiving Water Quality - Technical Memorandum N, August 2004, prepared by SRK Consulting (Canada) Inc.
- Supplemental Climate and Hydrology – Technical Memorandum C, October 2003, prepared by SRK Consulting (Canada) Inc.

The site water management plan was updated in the following document:

- Site Water Management Plan, October 2005, prepared by Tahera Diamond Corporation.

The coarse PK stockpiles will be constructed adjacent to the PKCA area. The construction and layout of the coarse PK stockpiles are described in the following document:

- Waste Rock Management Plan (Part 2, Kimberlite Ore, Coarse Processed Kimberlite and Recovery Circuit Rejects), January 2006, prepared by SRK Consulting (Canada) Inc.

At the time of preparing this report, only minor additional technical information was available beyond what was presented for the water licence application. Due to a change in the mine economics, the mine plan now states that the lower grade ore will be processed (as opposed to being stockpiled). This results in an increased amount of fine PK reporting to the PKCA. The change has resulted in some revisions to the final fine PK surface elevations and has also resulted in the requirement for an additional divider dyke within the PKCA.

2.0 FACILITY DESCRIPTION

The PKCA is located within the existing Long Lake Basin that is at the south end of the project site. The project site layout is shown in Figures 1 and 2. The PKCA layout is shown in Figure 3.

The original lake level of Long Lake was 515.4 m. The maximum operating storage water level of the PKCA has been defined as 523 m. Four dams will be constructed around the facility to allow the water level to potentially rise to this level and remain stored within the PKCA.

The PKCA will be divided into three cells; Cell A, Cell B and Cell C. Fine Processed Kimberlite (fine PK) will first be deposited into Cell A, between the East and Southeast Dams and Divider Dyke A. Once Cell A is full, fine PK will be deposited in Cell B. Water will filter through the divider dykes into the western portion (Cell C) of the PKCA.

No fine PK will be deposited in Cell C. It will remain as a 'polishing pond' to facilitate the settlement of any remaining suspended solids so that excess water can be discharged to Stream C3 during the summer and fall.

The water level in the facility is ultimately controlled by discharging of compliant water over the West Dam located at the west end of the PKCA. Details of the fine PK disposal and water management are described in the following sections.

Stage storage volumes for individual cells are shown in Figure 4.

3.0 FINE PK DISPOSAL MANAGEMENT

3.1 QUANTITIES

The production rate for the fine PK has been estimated based on processing all of the kimberlite mined. This is summarized in Table 1 as provided by Tahera and assumes all low grade ore is processed. Previous test work estimates the percentage of fine PK will be 15% of plant ore feed. This may vary depending on actual processing characteristics.

TABLE 1: ESTIMATED PRODUCTION RATES FOR KIMBERLITE ORE AND FINE PK (ANNUAL PRODUCTION)

Year	Kimberlite Ore (tonnes)	Fine PK (Solids Weight) (tonnes)	Fine PK – Placed and Consolidated Volume (m^3)**
1	630,000	94,500	189,000
2	720,000	108,000	216,000
3	720,000	108,000	216,000
4	720,000	108,000	216,000
5	720,000	108,000	216,000
6	720,000	108,000	216,000
7	720,000	108,000	216,000
Total	4,950,000	742,500	1,485,000

**Assumes placed at a dry density of 0.5 t/m^3

3.2 PROCESSED KIMBERLITE CHARACTERISTICS

The kimberlite ore will be processed using conventional diamond processing techniques and the main steps are as follows:

- Crushing – breakage of ore to liberate the diamonds;

- Scrubbing – breakage of soft conglomerates;
- Dense medium separation (DMS) – gravity concentration to separate heavy and light particles;
- Interparticle crushing – reduction of large particles without diamond breakage;
- X-ray sorting; and
- Cleaning and sorting.

Processing of the kimberlite will produce three process kimberlite (PK) products:

- Coarse PK, comprised of gravely sand will make up about 81% of the total PK by weight. The management of the coarse PK is presented in the Waste Rock Management Plan, Part 2 (SRK 2006). A portion of the coarse PK will be stockpiled in the vicinity of the PKCA as shown in Figure 2. Properties of the coarse PK are discussed in Section 5.4 of this report.
- Recovery plant rejects, comprised of a medium sand and fine gravel will make up about 4% of the total PK by weight. The management of the plant rejects is included in the coarse PK management (Waste Rock Management Plan, Part 2).
- Fine PK (less than 0.1 mm grain size) comprised of 70 to 85% silt and 15 to 30 % clay. Fine PK will make up about 15% of the total PK product by weight. The fine PK will be pumped as a slurry to the PKCA. Properties of the fine PK are discussed in the following section.

3.3 FINE PK PROPERTIES

Testing of the fine PK was carried out on samples from the Jericho bulk processing plant in 1997. The properties of the fine PK presented below are based on these tests.

At the time of preparation of this report the Jericho Processing Plant was just starting to process fine PK. Additional testing on the fine PK is currently being carried out.

3.3.1 Particle Size

The typical particle size distribution of the fine PK is shown in Figure 5.

3.3.2 Discharge Solids Content

The fine PK will be discharged as the underflow from the process plant thickener. It is anticipated that, under normal operations, it will be discharged from the thickener at approximately 30% solids content. This is equivalent to dry density of 0.37 t/m^3.

3.3.3 Specific Gravity

Specific gravity testing of one sample of the coarse PK was carried out by EBA in January 2006. The measured apparent specific gravity was 2.74. It has been assumed the specific gravity of the fine PK is equal to that of the coarse PK.

3.3.4 Settling and Placed Density

Six settling tests performed on fine PK samples from the bulk processing plant in 1997 indicated that the fine PK achieved dry settled density of approximately 0.99 t/m^3. Three additional settling tests carried out in 2006 by the Jericho Process Plant had an average dry settled density 0.96 t/m^3.

These densities were achieved in laboratory conditions, i.e. no ice entrainment. A portion of the deposited fine PK will freeze as it is deposited in the winter months. The winter placed fine PK will freeze at a dry density close to its deposited density of 0.37 t/m^3. Some of this will thaw the following summer; however some may remain frozen in perpetuity. The frozen winter tailings are expected to be at a density close to the deposited density plus the expansion that occurs when the pore fluid freezes.

An effective settled dry density of 0.5 t/m^3 has been used in the solids balance of the facility that includes the consolidated process kimberlite, and the winter placed frozen ice entrained process kimberlite. This density is considered to be conservatively low, meaning that the likelihood is that the fine PK may be denser and occupy less volume than described herein. The actual average density should be monitored as described in Section 6.2 of this report.

3.4 FLOCCULANTS AND COAGULANTS

A coagulant and flocculant polymer treatment in conjunction with a thickener is used to clarify the thickener supernatant to allow 90% of the water to be recycled in the plant and thicken the fine PK to a solids content of approximately 30% prior to discharge to the PKCA.

The polymers will be added at the head of the feed launder prior to entering the thickener. The coagulant and flocculant polymers are added separately. The thickener uses highly interactive water clarification and compaction processes to produce relatively clear overflow water and a thickened fine PK underflow.

The polymer treatment causes the water to be clarified in the feed well of the thickener by the formation of flocs of the fine PK. The floc density increases until it settles into the compaction zone. The density of the flocculated material in the compaction zone increases through self-weight consolidation enhanced by dewatering.

The fine PK particles are small and negatively charged therefore they tend to remain in suspension. The coagulant is added to the feed and used to change the negative charge of the particles. The coagulant has a very strong positive charge. This strong positive charge neutralizes the negative charge and leaves the particle with a slight positive charge.

As the particles are bonded together to form a long string of floc particles, the mass or weight of the particle increases. Once the mass is great enough, the particle will sink to the bottom of the thickener. The fine PK underflow at the base of the thickener is then pumped to the PKCA.

The polymers currently being used are:

- Flocculant - SNF Flo Polymer AF 4400
- Coagulant - SNF Flo Polymer CV4120B

The process plant is currently using the following dosage rates as listed in Table 2. The dosages will be modified accordingly to obtain a material that will settle and clarify.

TABLE 2: TYPICAL COAGULANT AND FLOCCULANT APPLICATION

	Solution Concentration (g/l)	Maximum Flow Rate of Solution Concentration Application (l/min)	Concentration in fine PK (based on dry weight)* (g/t)
Flocculant	2.5	6.5	81
Coagulant	5	2	50

* Concentration based on ore production rate of 1920 t/day and 15% fine PK output

3.5 DEPOSITION PLAN

The fine PK will first deposited within Cell A; once Cell A is near capacity fine PK will be deposited in Cell B.

The fine PK will be discharged at various points around the north, east, and south perimeter of Cell A.

The proposed location of the discharge points are shown in Figure 3. The discharge points will be periodically moved to create an even PK surface around the Cell A perimeter. It is expected that the fine PK will beach to a relatively low slope angle (0.5 to 1.0 %). The fine PK will be placed such that the slope will be towards the center of the basin, leaving a low area in the west central portion of Cell A, adjacent to Divider Dyke A. The slope of the fine PK will minimize the amount of water ponding around the Cell A perimeter. The spigot locations and discharge in Cell B will be based on performance observations. The discharge will be adjusted to direct all excess supernatant water flow towards the west end of the PKCA.

3.6 FINE PK SOLIDS LEVEL

The projected average fine PK level in Cell A and Cell B is shown in Figure 6. The level will vary throughout the Cells due to the slope of the fine PK. In Cell A, the fine PK will slope down from the perimeter of the cell to the center of the cell and towards Divider Dyke A. The estimated fine PK elevation around Cell A's perimeter is also shown in Figure 6. In Cell B, the fine PK will slope downwards from Divider Dyke A to Divider Dyke B. The estimated elevation of fine PK at Divider Dyke A in Cell B is shown in

Figure 6. The actual elevation will depend on the slopes above and below the water level based. The elevations in Figure 6 are based on a slope of 0.5%.

3.7 ENTRAINED ICE

Ice may be entrained within the PKCA if fine PK is deposited over a frozen ponded areas in excessive layers. Ice may also be entrained when fine PK freezes before it settles or consolidates. Entrained ice within the fine PK will consume capacity in the PKCA.

Covering frozen ponded areas can be minimized by keeping the water levels in the PKCA low (e.g., the amount of free water in the deposition cell should be minimized prior to depositing in freezing conditions).

4.0 OPERATIONAL WATER MANAGEMENT

4.1 WATER BALANCE

4.1.1 Objectives

Water balance for the PKCA was carried out for the following objectives:

- Projecting water elevations in PKCA for Cells A, B, and C;
- Estimating the discharge volume and rate for the water released from Cell C to Stream C3;
- Estimating total retention time of the PKCA under a "Zero Discharge" scenario when no water is allowed to be discharged to the environment (Lake C3);
- Providing information to determine future construction requirements and contingency measures.

4.1.2 Water Sources

The drainage basins of Jericho Mine and a schematic of the site water management plan is shown in Figures 2 and 7 respectively. The PKCA area is divided into three cells: Cells A, B and C. Water inflows to each of the cells consist of the following:

- Direct precipitation onto the pond surface;
- Runoff from the watershed of each cell;
- Water released from deposited fine PK as a result of settling and consolidation (Cell A or Cell B only);
- Seepage through the upgradient divider dyke from the up-gradient cell; and
- Runoff water collected from Pit Sump, Collection Ponds and/or East Sump and treated sewage effluent discharged into the PKCA (Cells A or B only).

Water outflows from each of the cells consist of the following sources:

- Evaporation from the pond surface;
- Seepage through the downgradient divider dyke of the cell;
- Reclaim water pumped from the PKCA to the process plant (Cell C only); and
- Water discharged from the PKCA to Stream C3 (Cell C only).

4.1.3 Methodology

A water quantity balance model was developed using Excel spreadsheets. The spreadsheet model used weekly time steps to simulate the inflows and outflows for each of the cells in the PKCA. The seepage volume through each of the divider dykes at a given time step is estimated automatically by macros based on the known upstream and downstream water elevations and the average dyke hydraulic conductivity. The variations of the filter width, water head across the filter, and filter seepage area with water elevation were considered to estimate the seepage volume through the dyke. An iterative procedure is automatically executed for each time step to adjust the water elevations in the three cells and to re-estimate the seepage volumes through the dykes until converged water balance is obtained in all three cells at the end of the time step (with water level differences in two iterations less than 0.01 m).

4.2 WATER BALANCE MODEL BASIS AND ASSUMPTIONS

4.2.1 Climatic and Hydrological Data

The climatic and hydrological data required for the water balance analyses includes precipitation, lake surface evaporation, and runoff for watershed areas in the vicinity of the mine site. A detailed study of the climate and hydrology for the Jericho Mine project has been carried out (SRK, 2003b). Based on the findings in the study, the following parameters were adopted in the current water balance analyses:

- Annual precipitation of 330 mm for a mean (1 in 2 return period) year;
- Mean annual runoff of 225 mm corresponding to a mean runoff coefficient of 0.682;
- Annual lake surface evaporation of 270 mm; and
- Annual precipitation of 500 mm for a 1:100 event wet year.

The monthly distributions of the runoff and lake surface evaporation are listed in Table 3.

TABLE 3: MONTHLY DISTRIBUTIONS OF RUNOFF AND LAKE SURFACE EVAPORATION				
Month	Monthly Percentage of Runoff (%)	Monthly Runoff (Mean) (mm)	Monthly Runoff (1:100 Wet) (mm)	Monthly Lake Surface Evaporation (mm)
May	3	7	10	14
June	57	128	194	78
July	16	36	55	97
August	10	23	34	57
September	13	29	44	24
October	1	2	3	0
November to April	0	0	0	0
Annual	100	225	340	270

4.2.2 Storage Curves and Initial Pond Elevations

The stage storage curves for the PKCA Cells A, B, and C are shown in Figure 4.

The original water level of Long Lake was 515.4 m; however water was pumped out of the lake in fall 2005. The measured ice surface elevation in early February 2006 was 513.87 m in Cell A and 512.64 m in Cells B and C. These values were used as initial pond elevations in January 2006 for the water balance analyses.

4.2.3 Mine Site Runoff Water, Pit Seepage Water, and Sewage to PKCA

The catchment areas within the Jericho mine site are shown in Figure 2 and summarized in Table 4. Runoff from Catchment Areas A, B, Plant Site and the Pit Area, will be collected and pumped through the East Sump and then to the PKCA as described in the "Site Water Management Plan" (Tahera, 2005).

TABLE 4: MINE SITE CATCHMENT AREAS	
Catchment Area	Area (m^2)
PKCA (Cell A)	215,300
PKCA (Cell B)	127,500
PKCA (Cell C)	191,900
Catchment Area A	557,000
Catchment Area B	178,800
Plant Site Catchment Area	308,200
Pit Area Catchment	241,700

Waste Rock Dump #1, located in Catchment Area A, will not be constructed until the last quarter of 2006, if required (SRK, 2005, Waste Rock Management Plan, Part 1). As Dump

#1 will not be started until late 2006, no runoff water will come off Waste Rock Dump #1 in 2006; therefore, the runoff water from the natural ground surface in Catchment Area A will not be collected and pumped to the PKCA in 2006. Similarly, minimal coarse PK will be placed upslope of the East Sump in the Plant Site Catchment Area in 2006. Only local runoff from the area within the plant site catchment area that is now directed into the East Sump will be collected in 2006. It is assumed that no runoff water from Catchment Area A will be pumped to the PKCA in 2006 as described in the Site Water Management Plan (Tahera, 2005) for the current water balance. Runoff from Catchment Area B and the Pit Area Catchment will be pumped to the PKCA in 2006.

Runoff from Catchment Areas A and B, and the Plant Site and Pit Area Catchment, will be pumped to the PKCA between 2007 and 2012. It was assumed that all water from the C1 Catchment is diverted through the C1 diversion and the C4 Catchment is diverted through the C4 diversion.

Permafrost is expected to exist throughout the Jericho pit with the exception of the active layer. Ground temperatures of approximately $-5^{O}C$ were measured from two thermistor strings installed in the Jericho kimberlite pipe at depths of 40 m and 223.5 m (SRK, 2003a). It is expected that the seepage through the permafrost into the open pit will be negligible. The seepage water into the pit was thus ignored in the current water balance.

Sewage effluent pumped to the PKCA was assumed to be 0.3 l/sec (or 9,500 m^3/year). This was based on measured effluent discharge rates in 2005.

4.2.4 Seepage through Divider Dykes A and B

Water flow between Cell A and Cell B is controlled by seepage through the internal Divider Dyke A when the water elevation in Cell A is below 523.0 m. The design cross-section and profile for Divider Dyke A is presented in Figure 9. The filter material is much finer than the transition material and run-of-mine waste rock in the dyke thus dominates the seepage rate through the dyke. For the purpose of estimating the seepage volume through the dyke, both the transition zone and waste rock zone can be practically ignored without introducing significant errors. Therefore, the design geometry of the filter was used in estimating the seepage through Divider Dyke A.

It is assumed that the standing water elevation in Cell A will be controlled such that it will be below elevation, 523.0 m. The coarse PK will be used to raise Dyke A above its original design crest elevation of 524.0 m. When required, an overflow ditch across Dyke A may be excavated to drain freely any extra water above the elevation of 523.0 m in Cell A to Cell B.

As Cell A becomes full, a second divider dyke will be constructed between Cell B and Cell C. Water flow from Cell B to Cell C will be via seepage through the internal Divider Dyke B. It is assumed that Dyke B will have a design cross-section similar to that for Dyke A; however, operating experience from Divider Dyke A's performance, will be used to optimize the design of Dyke B. A vertical profile along the proposed axis of Dyke B was used to calculate the vertical filter area for seepage calculations.

The hydraulic conductivity of a dyke filter material sample tested in EBA's laboratory was 1.3E-02 cm/sec. This value was used as the average hydraulic conductivity for the filter material for Dykes A and B in estimating seepage volume through the dykes.

It was assumed that the fine PK would completely block the filter area below the fine PK surface elevation; thus, no seepage water would pass through the blocked filter area.

It is expected that ice cover will form on the pond surfaces during winter. Based on measured ice cover thicknesses on similar ponds at the EKATI Diamond Mine site and past experience, the ice cover thickness in Cells A, B, and C of the PKCA was assumed to be 0.5 m in December, 0.8 m in January, 1.2 m in February, and 1.5 m from March to May. It was assumed that there would be no seepage through the ice covered filter area.

4.2.5 Discharge Water from Cell C to Stream C3

It is planned to discharge water, meeting discharge quality criteria, annually from the PKCA over the West Dam to Stream C3. The annual outflow from the PKCA will be maximized such the water level in Cell C is maintained at a lower level than the pre-existing natural level. This maximizes the storage volume in Cell C in the event that water cannot be discharged from the PKCA. The minimum operating pond surface elevation in Cell C will be 513.5 m to provide a sufficient water depth to avoid disturbing the lake bottom sediment.

A detailed study of receiving water quality for a series of discharge scenarios was conducted (SRK, 2004a). The study indicated that the minimum dilution of approximately 10:1 could occur within 200 metres of the mouth of Stream C3 in Lake C3 during the brief period immediately prior to break-up of the ice (assumed to be June 18 in the modeling) for the scenario with release of a total water volume of 959,500 m^3 within six months (25,000, 551,600, 153,100, 87,400, 121,300 and 21,000 m^3 from May to October respectively). Dilutions would then increase rapidly to approximately 20:1 by the beginning of July.

The discharge rate from the PKCA will be managed to achieve minimum 10:1 dilution at the edge of the mixing zone in Lake C3. The water balance analyses assumed that the following discharge schedule and monthly distributions would be applied to achieve the dilution ratio.

- No discharge to Stream C3 during the first two weeks of June to avoid potential low dilutions in the critical zone in Lake C3 prior to break-up of the lake ice;
- Monthly percentage of the total discharge to Stream C3 was assumed to be 40%, 25%, 15% and 20% from June to September from 2007 to 2012.

As discussed in Section 4.2.3, it is expected that much less water would be discharged into Stream C3 in 2006 due to lower initial pond elevations and less site runoff water pumped to the PKCA. The discharge to Stream C3 will occur during the period July to September 2006 as presented in the "Site Water Management Plan" (Tahera, 2005). The monthly percentage of the total discharge to Stream C3 in 2006 was assumed to be 50%, 35%, and 15% from July to September.

The current estimates of monthly discharges are less than those assumed in the water quality modeling (SRK, 2004a). The water quality at the stream outlet and within Lake C3 will be monitored as described in Section 6.0 to verify the quality and determine if the dilution is being achieved.

4.2.6 Reclaim Water from Cell C

An annual volume of 57,600 m^3 of water will be reclaimed from Cell C or the East Sump, to the process plant, which will be evenly distributed over the period from June to September as described in the "Site Water Management Plan" (Tahera, 2005). This volume and its monthly distributions were adopted in the current water balance.

4.2.7 Construction of Dyke B

Water balance results indicate that water elevation in Cell A will reach the maximum design water elevation of 523.0 m in 2008 for a mean precipitation year; however, may exceed 523.0 m by 2008, if a wet year occurs. Dyke B is required, prior to the freshet of 2008, to avoid water in Cell A overflowing directly into Cell C. In the current water balance analyses, the following assumptions were applied:

- Construction of Dyke B will be completed in December 2007;
- Dyke B will start to contain water in January 2008;
- Mine site runoff water and sewage discussed in Section 4.2.3 of this report will be pumped to Cell A prior to January 2008 and to Cell B between January 2008 and December 2012.

4.3 RESULTS AND DISCUSSIONS

4.3.1 Water Levels

The water balance was carried out to project water elevations in Cells A, B, and C during the production period of the mine. Three cases were simulated to predict water elevations in the cells under mean and one 1:100 wet year precipitation conditions. Annual discharge from Cell C to Stream C3 was assumed for the cases.

Figure 8 presents the predicted water elevations with time in Cells A, B, and C under mean precipitation years. The water elevations fluctuate over the mine production period and cycle annually in response to the annual freshet and water discharge from Cell C to Stream C3. Table 5 summarizes the annual inflows and outflows of the three cells under mean precipitation years. The detailed monthly water balance results are presented in Table A1 in Appendix A of this report.

TABLE 5: ANNUAL INFLOWS AND OUTFLOWS TO CELLS UNDER MEAN PRECIPITATION YEARS

Year	Cell A Yearly Water Balance					Cell B Yearly Water Balance						Cell C Yearly Water Balance				
	Year-End Pond Elevation of Cell A*	Direct Cell A Precipitation – Evaporation + Runoff from Watershed of Cell A	Runoff Water Collected from Catchments of Areas A and B, Plant Site Area, and Pit Area and Sewage into Cell A	Free Water from Tailings Placed in Cell A	Water Flowing from Cell A to Cell B (Seeping through Divider Dyke A when Fine PK Ele. In Cell A <524.0 m	Year End Pond Elevation of Cell B	Direct Cell B Precipitation -- Evaporation + Runoff from Watershed of Cell B	Runoff Water Collected from Catchments of Areas A and B, Plant Site Area, and Pit Area and Sewage into Cell B	Free Water from Tailings Placed in Cell B	Water Flowing from Cell A to Cell B (Seeping through Divider Dyke A when fine PK Ele. In Cell A <524.0 m)	Water Flowing from Cell B into Cell C (Seeping through Divider Dyke B after Jan 2008)	Year End Pond Elevation of Cell C	Direct Cell C Precipitation – Evaporation + Runoff from Watershed of Cell C	Water Flowing from Cell B to Cell C (Seeping through Divider Dyke B after Jan 2008)	Water Reclaimed from Cell C to Plant	Water Release from Cell C to Stream C3
	(m)	(m^3)	(m^3)	(m^3)	(m^3)	(m)	(m^3)	(m^3)	(m^3)	(m^3)	(m^3)	(m)	(m^3)	(m^3)	(m^3)	(m^3)
2005	513.87					512.64						512.64				
2006	518.13	38,995	140,854	66,118	242,325	514.81	25,972	0	0	242,325	240,276	514.81	39,881	240,276	57,600	185,000
2007	520.93	32,166	298,745	75,416	396,135	515.18	25,675	0	0	396,135	413,615	515.18	39,649	413,615	57,600	387,000
2008	522.64	38,571	0	75,623	131,789	515.68	22,560	298,771	0	131,789	440,499	515.66	39,404	440,499	57,600	409,000
2009	524.12	37,322	0	75,416	131,707	515.97	22,362	298,745	0	131,707	446,892	515.85	39,150	446,892	57,600	423,000
2010	525.67	48,436	0	75,416	124,004	515.74	22,101	298,745	0	124,004	450,890	515.63	38,837	450,890	57,600	438,000
2011	526.57	48,436	0	43,803	91,309	517.56	22,240	298,745	31,613	91,309	474,959	515.97	39,111	474,959	57,600	447,000
2012	526.57	48,436	0	0	48,436	521.23	16,644	298,771	75,623	48,436	443,453	515.87	38,588	443,453	57,600	427,000

* Average fine PK surface elevation of Cell A after 2008

The maximum predicted water elevations in the cells are summarized in Table 6 for mean conditions and 1:100 wet year conditions. The maximum predicted water elevations are below the maximum operating water elevation of 523.0 m.

TABLE 6: PREDICTED MAXIMUM WATER ELEVATIONS WITH ANNUAL DISCHARGE

Precipitation	Maximum Predicted Water Elevation (m)		
	Cell A before January 2008	Cell B	Cell C
Mean during the whole production period	521.0	521.2	518.2
One 1:100 wet year in 2007 and mean for other years	521.6	521.2	518.2
One 1:100 wet year in 2012 and mean for other years	521.0	521.8	518.9

4.3.2 Water Discharge over West Dam

Clear water in Cell C will be annually pumped over West Dam into Stream C3 from June 15 to September 30 with a specified monthly percentage for each month. The estimated annual discharge water volume under mean precipitation years is listed in Table 5 (last column). The discharge pumping rates are shown in Figure 8 for mean precipitation years. The maximum annual discharge volumes and pumping rates for the three precipitation cases are summarized in Table 7.

TABLE 7: MAXIMUM ANNUAL DISCHARGE VOLUMES AND PUMPING RATES

Precipitation	Maximum Annual Discharge Volume (m^3)	Maximum Pumping Rate (l/sec)
Mean precipitation during the entire production period	447,000	138
One 1:100 wet year in 2007 and mean precipitation for other years	578,000	178
One 1:100 wet year in 2012 and mean precipitation for other years	625,000	193

4.3.3 Dilution Ratio in Lake C3

A detailed study of the receiving water quality in Lake C3 was presented in SRK (2004b) and SRK (2004a). The study indicated that the minimum dilution could occur within 200 metres of the month of Stream C3 in Lake C3 during the brief period immediately prior to break-up of the ice (assumed to be June 18 in the modeling) and dilutions would then increase rapidly by the beginning of July and after.

One of the scenarios modeled in SRK (2004a) assumed an annual release of 959,500 m^3 of water from Cell C into the average flows of the receiving environment (Lake C3). Table 8 lists the discharge water volumes and the predicted minimum dilution values during specified periods for the scenario. For comparison, Table 8 also lists the predicted maximum discharge volumes during the same periods for a mean precipitation year in the current study. The predicted maximum discharge volumes in the current study are lower than that simulated in SRK (2004a); therefore, the minimum dilution is expected to be greater than 10:1.

TABLE 8: DISCHARGE VOLUMES AND PREDICTED MINIMUM DILUTION RATIO

Time Period	Discharge Volume Simulated in SRK (2004a) (m^3)	Predicted Minimum Dilution Ratio within 200 Metres of the Mouth of Stream C3 in Lake C3 (SRK, 2004a)	Predicted Maximum Discharge for a Mean Precipitation Year (This Study)
June 1 to 15	275,785	10	0
June 16 to 30	275,785	10 to 20	178,800
July 1 to 31	153,138	>20	111,750
August 1 to 31	87,411	>20	67,050
September 1 to 30	121,291	>20	89,400

The discharge water quality in Cell C and the receiving water quality in Lake C3 will be monitored during the life of mine operation. The discharge water volume may be regulated to meet the water quality requirements stated in the water license.

4.3.4 Seepage through Divider Dykes

Seepage volumes through Divider Dykes A and B were estimated based on the assumptions presented in Section 4.2.4. The water will flow freely between Cell B and C prior to completion of Dyke B in 2007/2008. It was also assumed that water in Cell A will flow freely to Cell B after the average fine PK surface elevation is greater than the original Dyke A design crest elevation of 524.0 m. The annual volumes of water flowing between the cells (including seepage through the dykes) are summarized in Table 5.

The seepage rates are dependent on the permeability of the dyke filter. The permeability may vary from the assumed values, and may reduce over time as the filter blinds off. The water balance should be recalibrated with field data to determine the dyke permeability and impact on the water levels and water balance. This is discussed further in Section 6.0 of this report.

4.3.5 Water Retention Time with Zero Discharge

Analyses were conducted to estimate the retention time of the PKCA if no water is allowed to discharge from Cell C to Stream C3 for a period of time. Four different start dates of a no discharge condition were evaluated. Mean year precipitation was assumed for each case. The predicted water retention time for the water level to reach elevation 523 m is listed in Table 9.

TABLE 9: WATER RETENTION TIME WITH ZERO DISCHARGE		
Start Date with Zero Discharge	Predicted Date when Water Level in Cell B or C reaches 523.0 m	Total Retention Time (Year)
January 1, 2006	August 31, 2008	2.6
October 1, 2006	December 31, 2008	2.2
October 1, 2009	August 15, 2011	1.9
October 1, 2011	> December 31, 2012	> 1.2

4.3.6 Freeboard

The "maximum operating water level" for the PKCA has been defined as elevation 523 m. The water level may rise above this level while flood waters are discharged and will also be higher due to waves and wave run-up.

The maximum wave height for the West Dam is estimated to be 0.5 m (EBA 2005c). The wave heights at the divider dykes and East and Southeast Dams are slightly less.

The "maximum water level" that includes waves and a temporary rise during flood routing has been defined as 524 m for the PKCA. The water retention elements in the dams have been specified to be at elevation 524 m.

The difference between the "maximum operating water level" and "maximum water level" is the freeboard.

4.3.7 Extreme Events

The 24-hour probable maximum precipitation (PMP) event for the site is estimated, in SRK 2003b, to be 160 mm. For comparison, the greatest daily rainfall measured at either the Contowoyto Lake station or Lupin Airport was 42 mm, or a quarter of the estimated 24-hour PMP.

The total volume of the runoff water from the PKCA basin will be 85,500 m^3 during the PMP event, assuming a runoff coefficient of 1.0. The water level in PKCA Cells B and C will rise to 523.5 m if no water is discharged during the PMP event (assuming Cell A is filled with fine PK at the time of the event). The water level can be pumped down to the maximum operating level of 523 m in seven days assuming a discharge rate of 150 l/sec.

Additional water from the other site areas may be pumped to the PKCA following an extreme event; however the inflow rate will be controlled to maintain the water level in the facility below the operating level.

4.3.8 Limitations

The water balance analyses has been conducted based on current available information and a number of assumptions based on our current knowledge and understanding. It is envisioned that actual water elevations in the cells of the PKCA will be different from those predicted in this report for the following reasons:

- Precipitation, lake surface evaporation, and runoff will vary from the assumed monthly means;
- Actual fine PK deposition plan and mine operating plan may be different from those adopted in this report;
- Actual fine PK properties such as settled dry density may be different from those used in this study;
- Actual discharge water volume and reclaim water volume from Cell C may be different from those presented in this report;
- Actual hydraulic conductivities and as-built geometries of the dyke filters may be different from those used in the report.

The water balance should be reviewed on an annual basis.

5.0 DAM AND DYKE DESIGNS

The PKCA facility requires the construction of dams and dykes to control the water level and discharge and fine PK. The dams and dykes are listed in Table 10 and shown in Figure 3. The dams and dykes have been designed following the Canadian Dam Safety Guidelines (1999).

All structures require that the detailed design and construction drawings be submitted to the Nunavut Water Board 60 days prior to construction. Documents have been submitted for the West Dam, East Dam, Southeast Dam, and Divider Dyke A. Designs will be prepared for the other structures prior to their construction. A brief description of the structures is presented in the following sections.

TABLE 10: SUMMARY OF PKCA DAMS AND DYKES

Structure	Function	Proposed Construction Period	Design Reference
West Dam	Water Control at outlet of PKCA	2005-2006	EBA 2005c
East Dam	Containment of fine PK	2005-2006	EBA 2005a
Southeast Dam	Containment of fine PK	2005-2006	EBA 2005a
Divider Dyke A	Containment of fine PK – flow through structure	2005-2006	EBA 2005b
Divider Dyke B	Containment of fine PK – flow through structure	2007	To be prepared
North Dam	Water Control	2006-2007	To be prepared
Cell A Coarse PK Perimeter Dyke	Containment of fine PK	Stage 1 2007-2008 Stage 2 2009-2010	To be prepared
Cell B South Dyke	Water Control	2007	To be prepared
West Settling Pond Dam	Water Control	Optional	To be prepared

5.1 WEST DAM

The West Dam design is described in EBA 2005c. The design criteria for the West Dam is as follows:

- The dam should retain water within the PKCA
- The dam will remain physically stable during the operational life of the mine.
- The dam will not be required after mine abandonment

The typical cross-section of the West Dam is shown in Figure 10. The main water retention element in the dam is a frozen core overlying a frozen foundation. An effective frozen core dam requires that the central core and foundation remain frozen year around to act as an impervious barrier against seepage. The core and foundation must be nearly saturated with ice to produce a well-bonded and impermeable mass, and the permafrost must be sustained. A secondary seepage barrier is provided by a geosynthetic liner on the upstream face of the frozen core. Similar designs have been developed by EBA for the EKATI Diamond Mine.

The upstream shell primarily consists of rockfill. A small till zone has been placed at lower elevations to reduce convective water movement through the open graded rockfill. The downstream shell of the dam will be constructed of rockfill. This will provide a strong material and will have minimal settlement. The rockfill shells are designed to be constructed with 3.0H:1V outside slopes.

The dam includes piping for the installation of thermosyphons. The need for thermosyphons will be based on the ground temperatures of the dam and foundation at the end of construction and over the life of the dam.

5.2 EAST AND SOUTHEAST DAM DESIGN

The design of the East and Southeast Dams are described in EBA 2005a. The design criteria for the East and Southeast Dams are as follows:

- The dams will retain fine PK solids.
- The water in the PKCA is planned to be maintained a low level; therefore, water will not be impounded against the East and Southeast Dams for long periods of time. However, the dams have been designed as water retaining structures since water may pond against the dams for short periods of time.
- The dams will remain physically stable during the operational life of the mine and following mine closure.

A typical cross section of the dams is shown in Figure 10. The main water retention element in the dams is a geomembrane liner. The liner is keyed into the ground using frozen saturated fill. Additional water retention will be provided by the fine processed, coarse processed kimberlite and till placed upstream of the liner. The dam foundation is designed to remain in a frozen condition thereby minimizing or eliminating seepage through the dam foundation.

It is planned to construct the dams as shown on the drawings to the full height in 2006.

5.3 DIVIDER DYKE "A" AND "B" DESIGN

The design of Divider Dyke A is described in EBA 2005b. The design criteria for the divider dykes are as follows:

- The dykes should retain the fine PK solids, to the extent practical. It will not be possible, or necessary, to prevent the movement of all colloidal particles through the dyke. These particles will combine and settle in the deposition cell following flocculation.
- The dyke should allow the movement of water from upstream (east) to downstream (west), as seepage flow through the dyke. In the event that seepage is impeded by the development of frozen zones or filter blinding, a surface overflow channel will be constructed in the dyke.
- The dyke will remain physically stable during the operational life of the mine and following mine closure.
- Divider Dyke A construction will begin in 2005 and will be raised in 2006. A second dyke, Divider Dyke B, will be constructed during future mine operations as the area upstream of Divider Dyke A fills with fine PK or as required for water quality.
- Divider Dyke A will be used a haul road for the construction of the West Dam.

The design cross section of Divider Dyke A is shown in Figure 9. The design for Divider Dyke B will be similar to Divider Dyke B. The final design of Divider Dyke B will be submitted to the NWB prior to construction.

5.4 PERIMETER BERM

Coarse PK stockpiles and berms will be placed around the perimeter of Cell A as shown in Figure 3. Fine PK will be deposited against the coarse PK stockpiles and berms. The perimeter berms are required when the fine PK level is above elevation 523 m. It is projected that the Perimeter Berms are required prior to the summer of 2008.

The properties of the coarse PK and the Perimeter Berms are discussed in the following sections.

5.4.1 Coarse PK geotechnical properties

Samples of coarse PK were provided to EBA by Tahera in January 2006 for geotechnical property testing. The following tests were carried out:

- Particle Size Analyses
- Specific Gravity
- Permeability
- Micro-Deval Abrasion
- Moisture Density Relationship

The coarse PK properties are variable depending on whether they include finer particles from the process plant high pressure grind circuit (HPGR). The HPGR circuit runs on a part time basis. The material that contains the HPGR feed is a well graded coarse sand with some fine gravel and trace of silt. Material without the HPGR feed is a uniformly graded medium sand with some fine gravel.

Particle size analyses were carried out on samples with and with out the HPGR feed. The remainder of tests were carried out on a sample that contained HPGR feed. Test Results are presented in Appendix C.

One permeability test was conducted. The sample was tested at density of 95% maximum dry density (as determined by ASTM 698). The measured hydraulic conductivity was 1.4×10^{-2} cm/s.

Micro-Deval Abrasion tests were carried out to determine the amount of material breakdown. Tests were carried out according to CAN/CSA A23.2-29A. The first two tests were carried on oven dried (110 °C) samples. An additional test is being carried out on an air-dried sample. The oven dried samples had a loss of 11% and 15% coarse and fine aggregate respectively.

5.4.2 Perimeter Berm Design

A perimeter berm is planned for the retention of fine PK above elevation 523 m in Cell A. The fine PK will be stacked against the berm.

It is intended to construct the berm of coarse PK or overburden till. Both materials are relatively permeable; however the intent is that no water will pond against the perimeter berms. The water level in Cell A will be maintained below the level of the fine PK. Free water adjacent to the berms, will be minimized by depositing fine PK in a manner that it slopes away from the perimeter berms and stockpiles. Seepage will be collected on the downstream side of the berms if necessary. Typical cross sections of the perimeter berms are shown in Figures 11 and 12.

The performance of the Perimeter Berms is dependent on the deposition and settling behaviour of the fine PK. This will be assessed over the coming years. The need for a liner in the Perimeter Berm will be determined prior to their construction. The final design and construction drawings of the Perimeter Berms will be submitted to the NWB prior to their construction, as per the conditions of the water license.

5.5 NORTH DAM

The North Dam is proposed to be constructed in a low area at the north side of Cell C. The dam is required to allow the water level to rise to the maximum design level of the PKCA (523 m) and prevent water from the PKCA area flowing into the drainage basin north of the PKCA. The natural ground at the saddle of the North Dam is approximately 518 m.

The projected water level in Cell C during 2006 is approximately 515.2 m assuming water is discharged in 2006 and 517.5 m assuming a no discharge condition in 2006. The natural saddle at the North Dam will restrict flow out of the PKCA during the first year of operation.

It is planned to construct the North Dam in the fall of 2006. It will be constructed as a lined dam with the liner keyed into the frozen ground and bedrock. The design and construction drawings for the North Dam will submitted to the NWB for approval prior to construction.

5.6 SETTLING POND DAM

An additional settling pond may be constructed downstream of the of the West Dam if additional settling time is needed to reduce the suspended solids level in the PK supernatant.

A preliminary design of the settling pond dam was described in the water license application supporting documents (SRK 2004c). The final design of the settling pond dam would be determined based on the settling requirements. The final design would be submitted to the NWB for approval prior to construction.

6.0 MONITORING

6.1 DAM SAFETY MONITORING

Visual Inspections

Daily visual inspections of the dams and tailings discharge should be carried out. Signs of instability, such as deformations, slumping and cracks should be reported to the design engineers. Signs of seepage from the dams and dykes should also be reported.

Ground Temperature Measurements

Ground temperature cables are planned to be installed in the West Dam, East Dam and Southeast Dam. The ground temperatures should be measured on a monthly basis.

Annual Geotechnical Inspections

The dams will be inspected annually be a geotechnical engineer. The inspection will include a visual assessment and review of the ground temperature data, and deformation monitoring data, water and fine PK levels. A report will be prepared summarizing the visual assessment and review of the monitoring information.

Dam Settlement

Settlement monitoring points will be installed in the dams at the end of construction. The elevation and location of the monitoring points should be measured on a monthly basis. The monitoring schedule should be reviewed if there are signs of movement.

Thermosyphons

Thermosyphon evaporator piping will be installed at the West Dam. Thermosyphon radiators will be installed if necessary. The operational temperature of the thermosyphon evaporators will be monitored with the installed ground temperature cables. The operation of the thermosyphons should also be checked on a visual basis by observing whether or not there is frost on the thermosyphons.

Topographic Survey

A topographic survey of the dam crest will be carried out on an annual basis. The survey should be carried out in a manner to identify any settlement areas of the dams.

6.2 VOLUME OCCUPATION

The volume of fine PK should be monitored in the facility. The elevation of the fine PK will be monitored using staff gauges at fine PK locations above the water level. A topographic survey and or a bathymetric survey of the top of the fine PK will be carried out on an annual basis. The surveys will also be used to determine the slope of the deposited fine PK.

The fine PK will be sampled to determine if fines segregation is occurring. The fine PK will also be sampled to determine in-situ density and ice contents.

Ice in the processed kimberlite occurs due to the fine PK freezing prior to settling and consolidation, and also occurs when water bodies are covered with frozen PK. Winter placement of fine PK over significant water bodies must be minimized.

6.3 WATER BALANCE

The water balance will be verified on an annual basis. The following components will be examined:

- hydrologic assumptions (precipitation, evaporation, and runoff),
- water levels in the PKCA cells
- discharge rates and quantities

6.4 FREEBOARD

The water level and freeboard in the PKCA will be monitored.

6.5 SEEPAGE

Seepage out of the dams and perimeter berms will be monitored. Sumps to collect the seepage and return it to the PKCA will be constructed if required.

6.6 PRECIPITATION

Daily precipitation measurements will be measured. This data will be used to calibrate the water balance, and forecast freshet events.

6.7 DISCHARGES

Discharge quantities into and out of the PKCA will monitored as specified in the Surveillance Monitoring Program associated with the Jericho Water Licence. The measured quantities will include:

- Discharge quantity from process plant,
- Discharge from East Sump, Collection Ponds and Pit Area to the PKCA,
- Reclaim water from the East Sump or PKCA, and
- Discharge quantity to the Stream C3

6.8 WATER QUALITY

The water quality will be monitored as specified in the Surveillance Monitoring Program associated with Jericho Water Licence.

7.0 ADAPTIVE MANAGEMENT

The Jericho Process Plant had just started operation at the time of preparing this document. It is expected that much will be learned about the processed kimberlite behaviour during the initial phase of operations. The performance will be monitored as described in

Section 6 of this report. The following highlights some of the key parameters that will closely monitored and operation may be adjusted if necessary.

- Fine PK Settling and Density: The settled density of the of the fine PK assumed for this plan is considered to be conservative; however if the placed density differs significantly the facility design will be re-evaluated.
- Supernatant Water Quality: The clarity and water quality of the supernatant water will be monitored. The operation of the process plant and addition of coagulants and flocculants will be adjusted to optimize the supernatant clarity and settling characteristics of the fine PK.
- The water quality of the PKCA discharge, Stream C3 and Lake C3 will be monitored. The dilution ratio will be calculated to determine performance of the system. The discharge rates may be adjusted to optimized the water quality if required.
- Runoff: The runoff coefficient assumed for the water balance was based on hydrology studies at the site. Pumping rates measured in 2005 indicate that the runoff coefficient may be lower than that assumed. Lower runoff coefficients may also be applicable for waste rock areas. The pumping rates and discharge quantities should be reviewed following the 2006 season to determine if the runoff coefficients are lower than assumed. Lower runoff coefficients will reduce the discharge quantities and pumping requirements.
- Ice Management: Placement of fine PK will be managed to reduce the amount of ice entrained within the fine PK. Winter deposition of fine PK will be placed under water when possible, or will be placed above the water level in areas that will not entrain ice.
- Fine PK Slopes: The design height of the dams and dykes has been based on a slope of fine PK of 0.5%. The basin design or discharge locations may have to be adjusted if the slopes are significantly different than assumed.
- Ponding Water in Cell A: Fine PK above the water maximum water level of the PKCA will be placed around the perimeter of Cell A in manner to reduce the amount of ponded water against the perimeter coarse PK berms. The spigot locations will be modified over time to achieve this.
- Divider Dyke seepage: The seepage rates through the divider dykes are based on laboratory testing of the dyke filter material. The field permeability of the material may vary. If the permeability is significantly lower than the assumed permeabilities it my be necessary to decant water from one cell to another. The water can be decanted via pumps or siphons or an overflow structure across the dyke can be constructed.
- Divider Dyke Filter: The specified particle size distribution of the divider dykes has been based on properties of the fine PK from the bulk process plant in 1997. The performance of the dyke filter will be monitored and filter testing using actual supernatant water may be carried out to refine the dyke filter particle size distribution

for the remaining construction of the Dyke A filter and the construction of the Dyke B filter.

- Perimeter Coarse PK Berm: The final design and construction drawings of the coarse PK perimeter berm will be prepared prior to construction. The need for a liner in the perimeter berm should be evaluated based on the fine PK performance in Cell A.
- Additional Settling Pond: The original design of the PKCA (SRK 2004) included the provision for a settling pond downstream of West Dam. The need for additional settling will be evaluated over the following years based on the performance of the facility and the discharge water quality.

8.0 CLOSURE

We trust this satisfies your present requirements. If you have any questions, please contact the undersigned at your convenience.

EBA Engineering Consultants Ltd.

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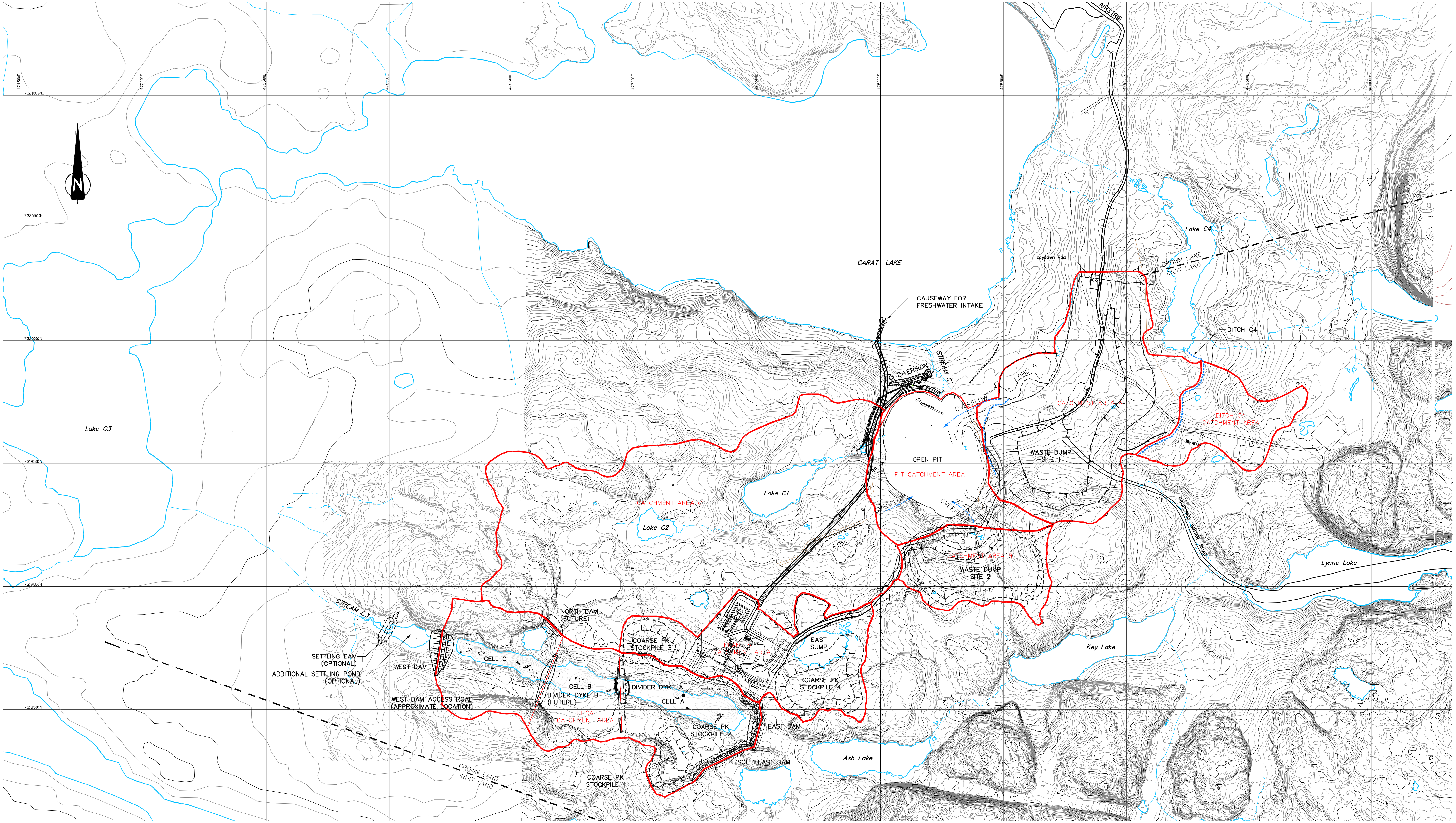
FIGURES



0 750
metres

Figure 1
Jericho Mine Regional Plan

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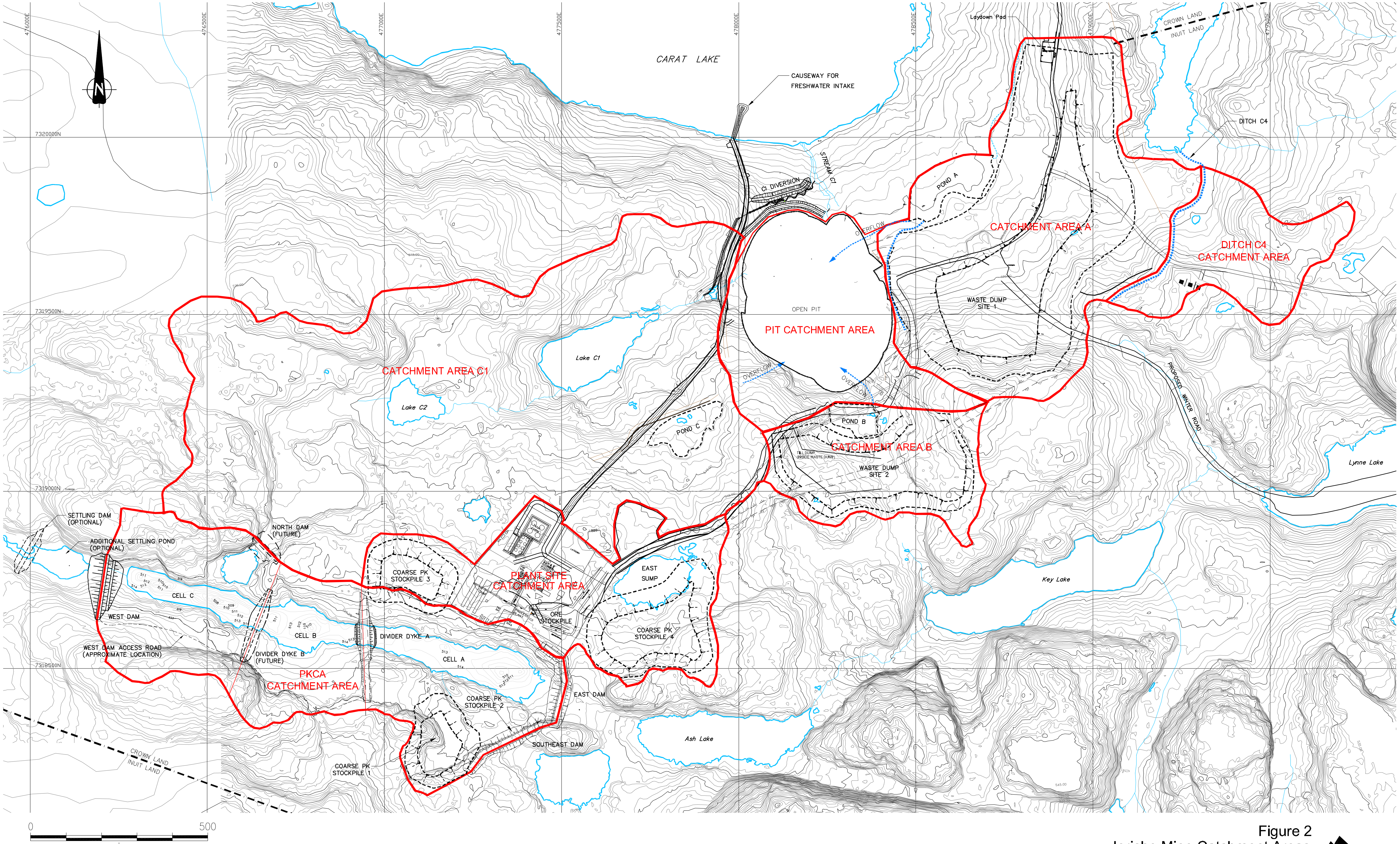

Figure 2
Jericho Mine Catchment Areas

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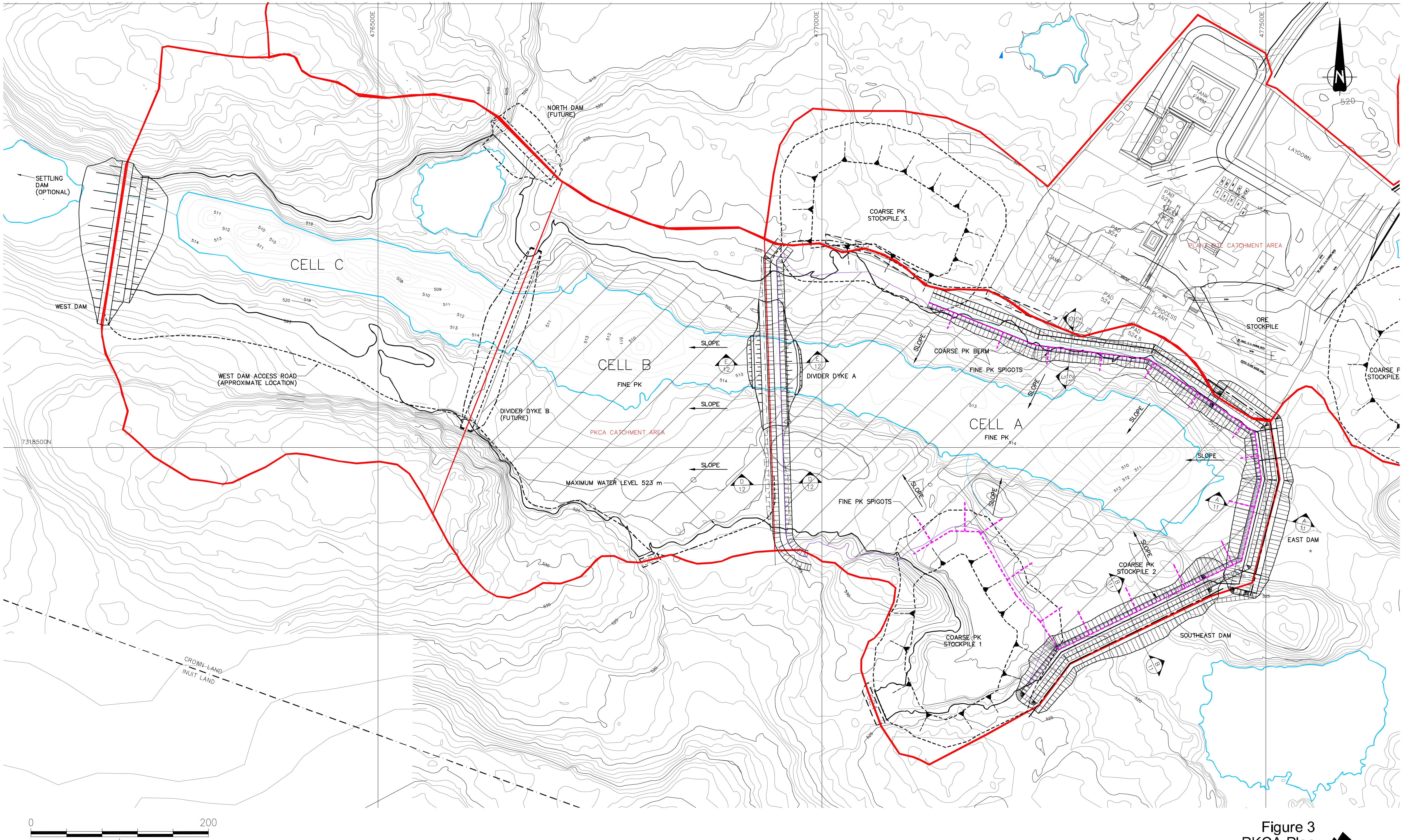

Figure 3
PKCA Plan

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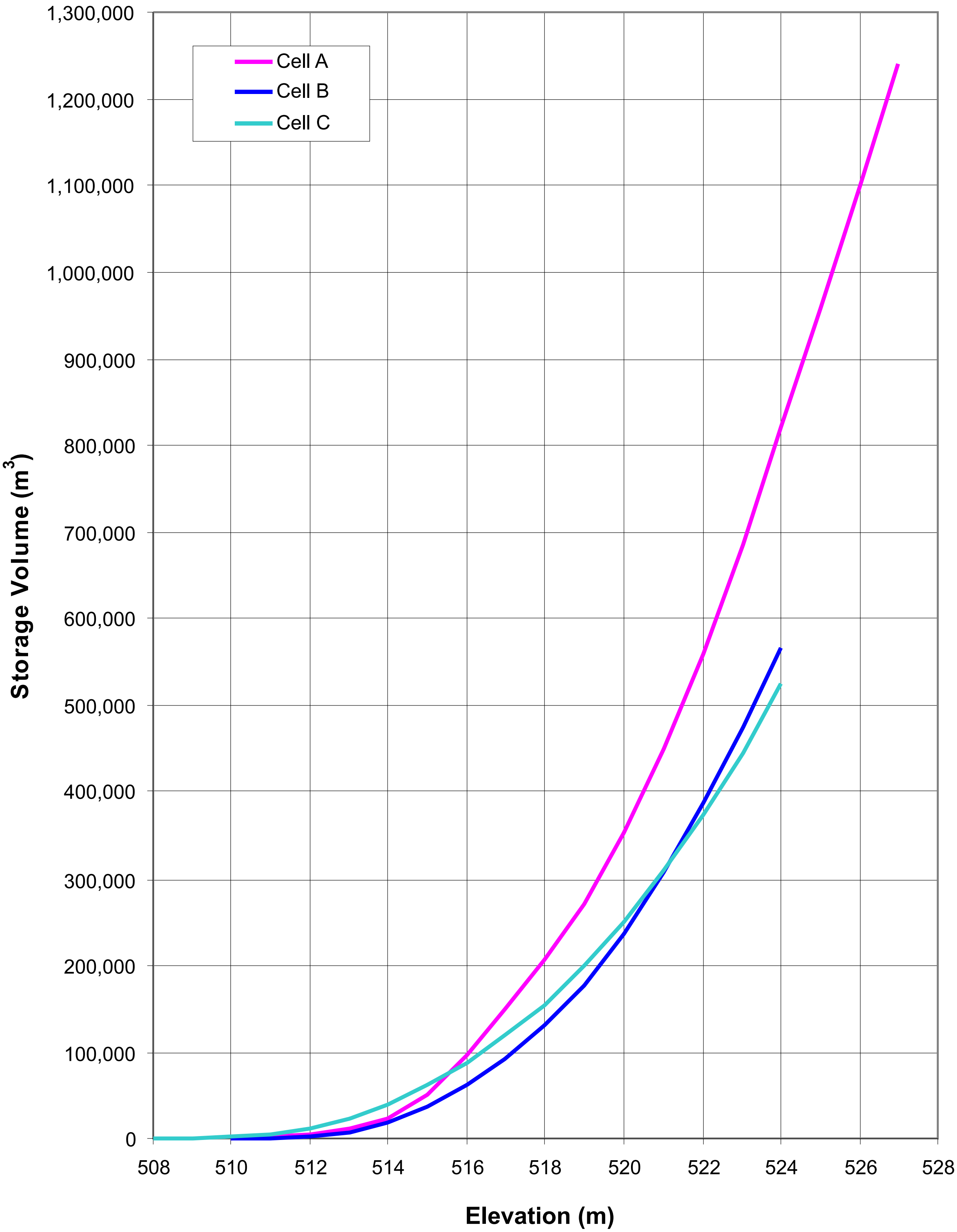

Figure 4

PKCA Storage Volumes

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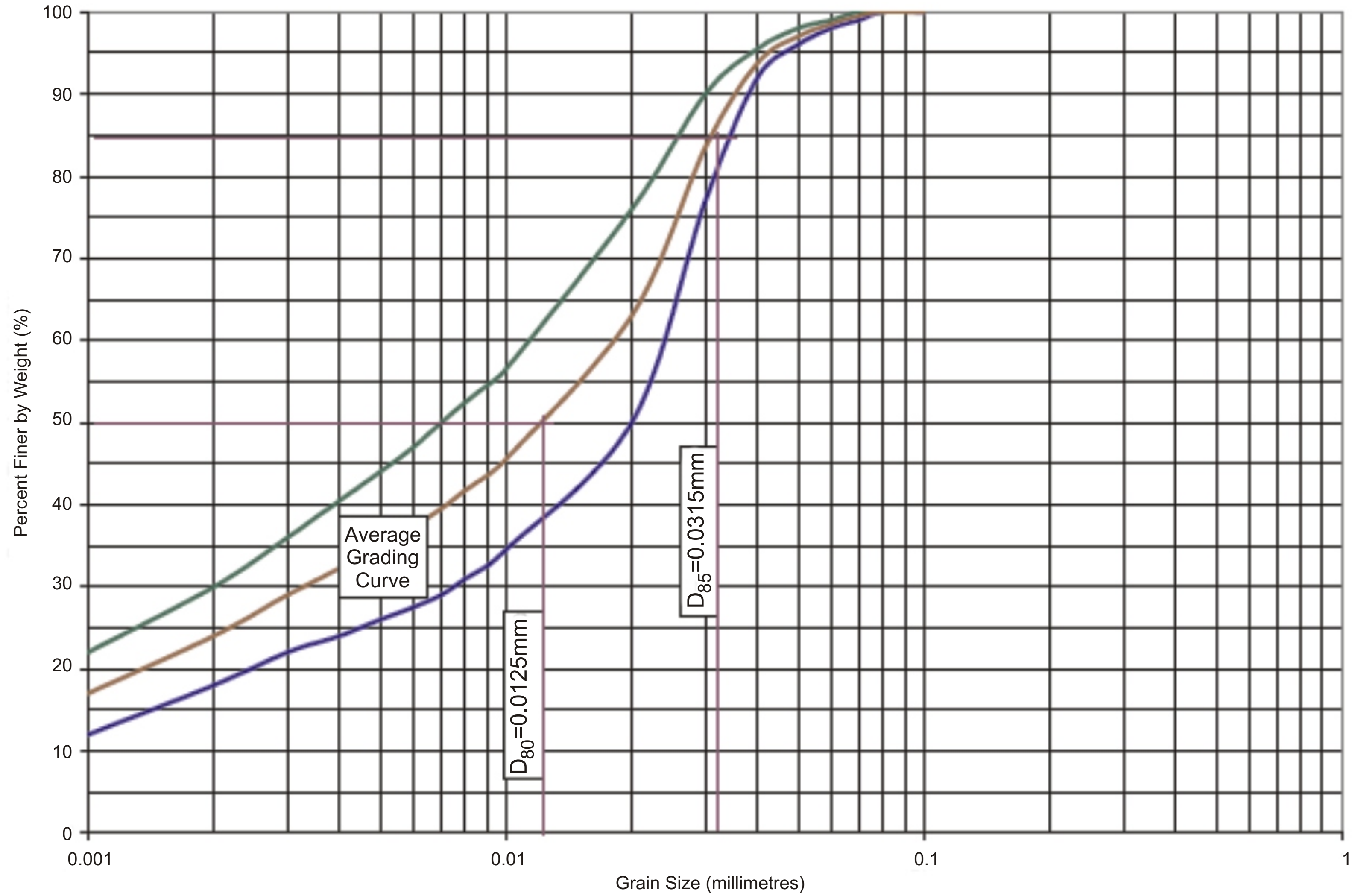

Reference: Adapted from SRK 2004c

Figure 5

Fine PK Particle Size Distribution

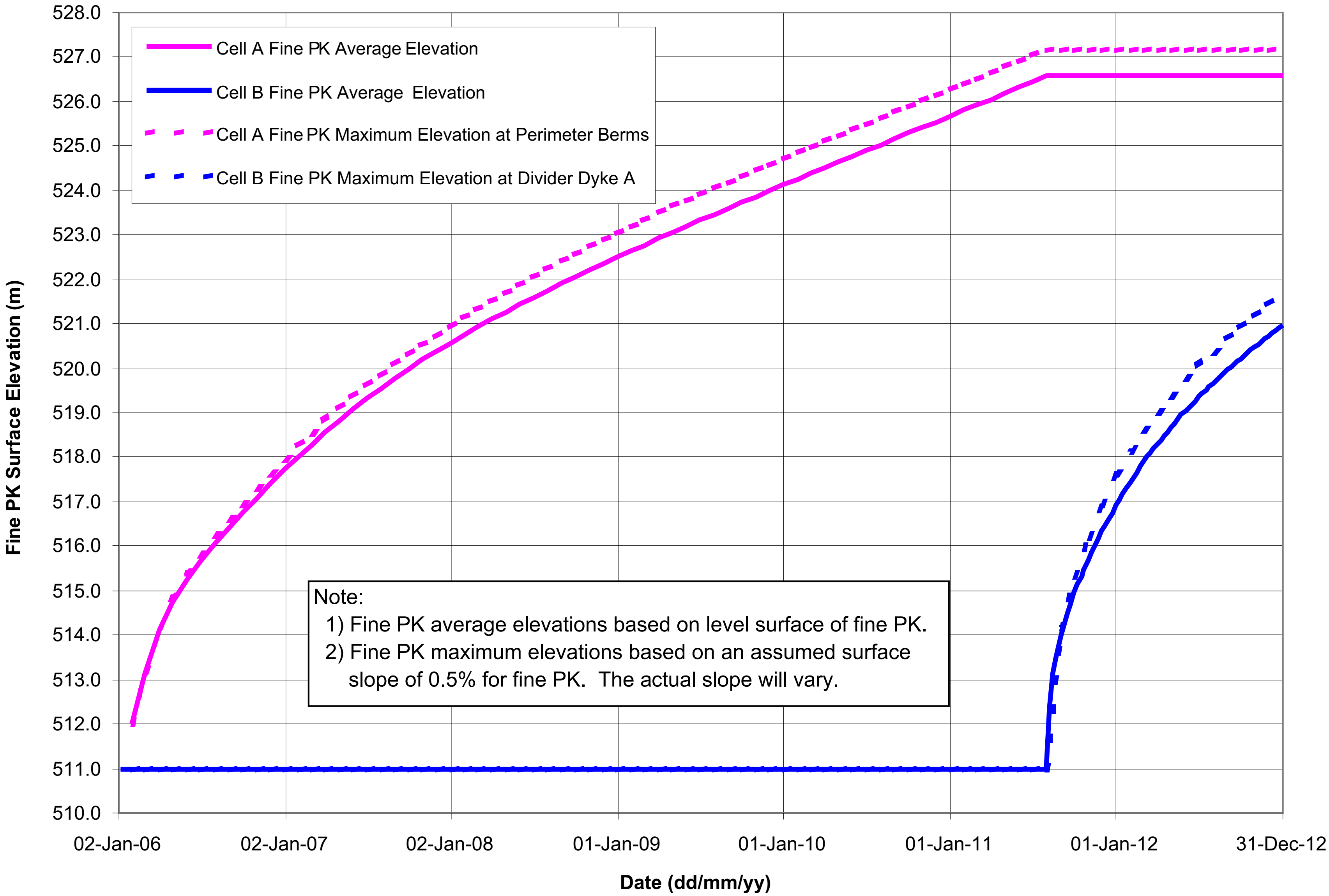

Figure 6

Fine PK Elevations

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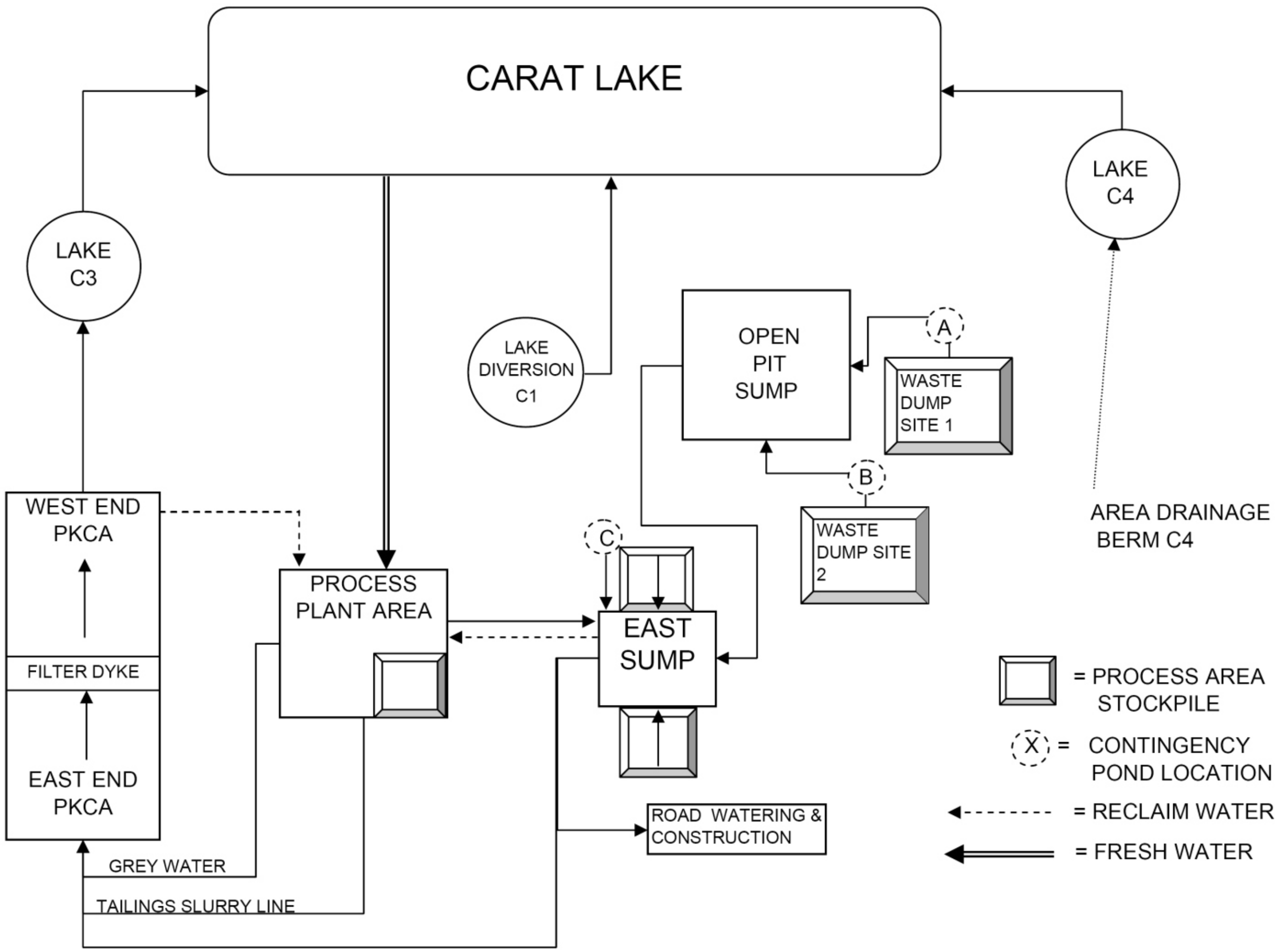

Figure 7

Reference: Adapted from Tahera 2005

Jericho Site Water Management Schematic

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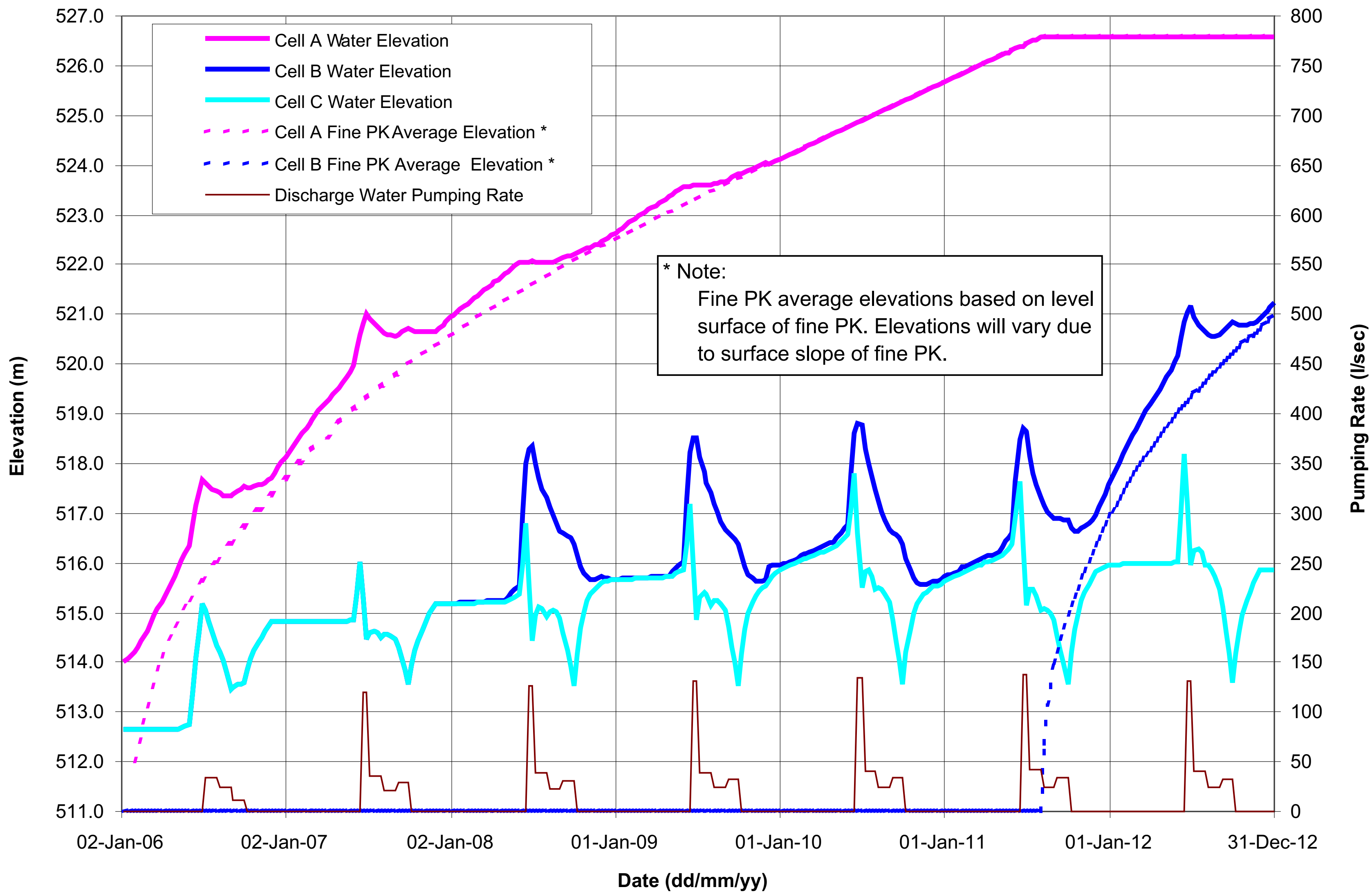
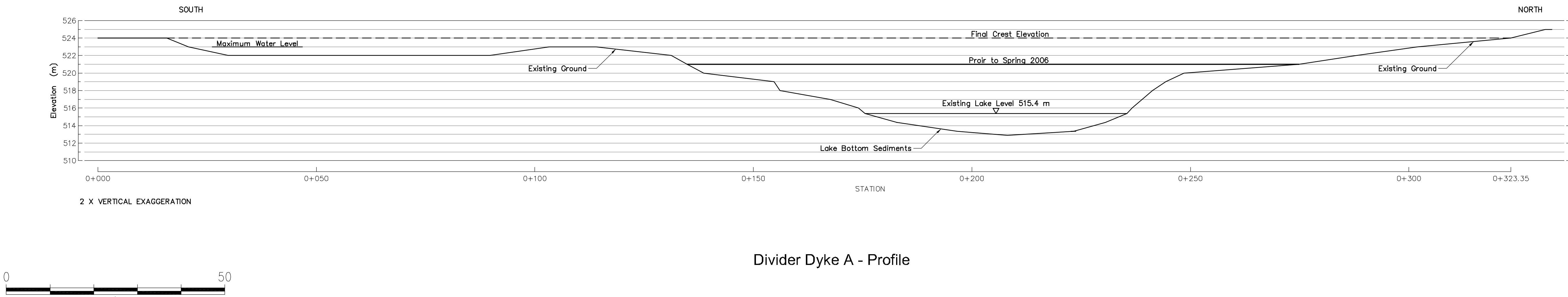
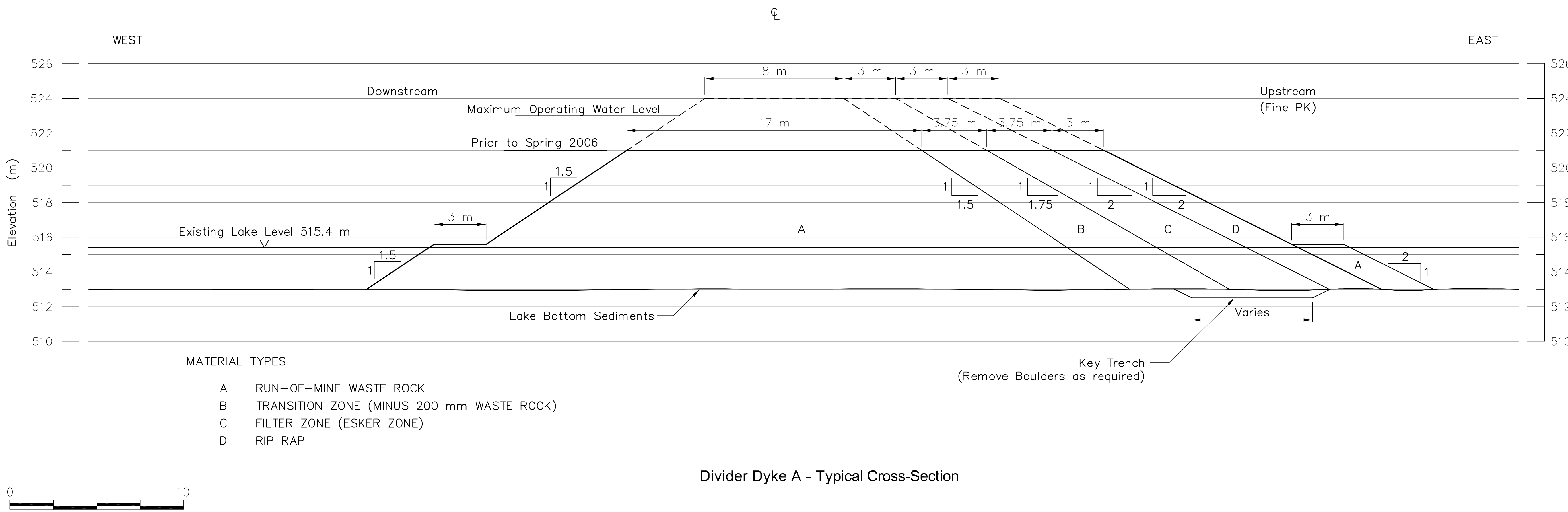


Figure 8
Water Levels in PKCA for Mean Precipitation Years



Divider Dyke A - Profile



Divider Dyke A - Typical Cross-Section

Figure 9
Divider Dyke A
Profile and Cross-Section

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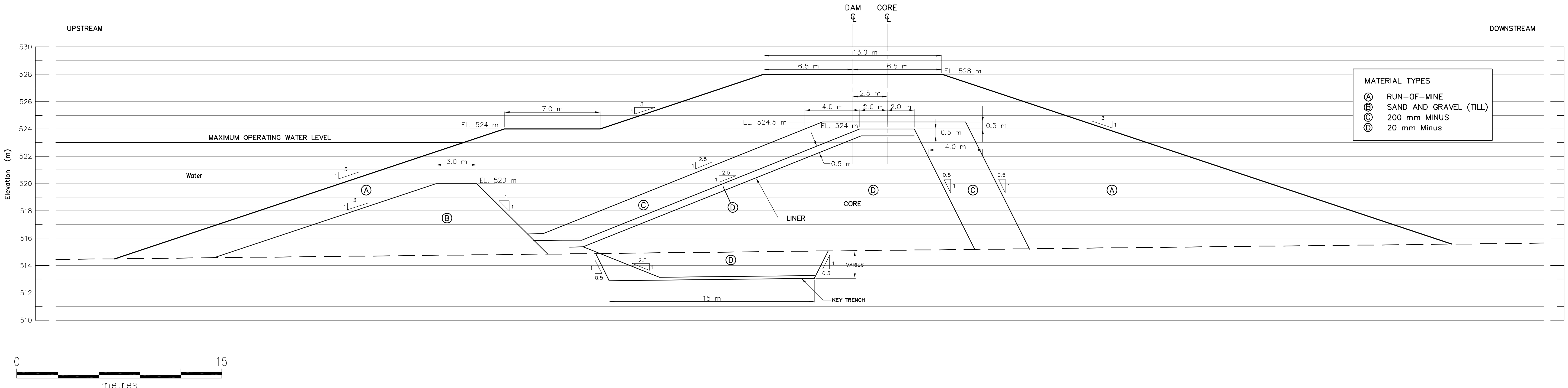
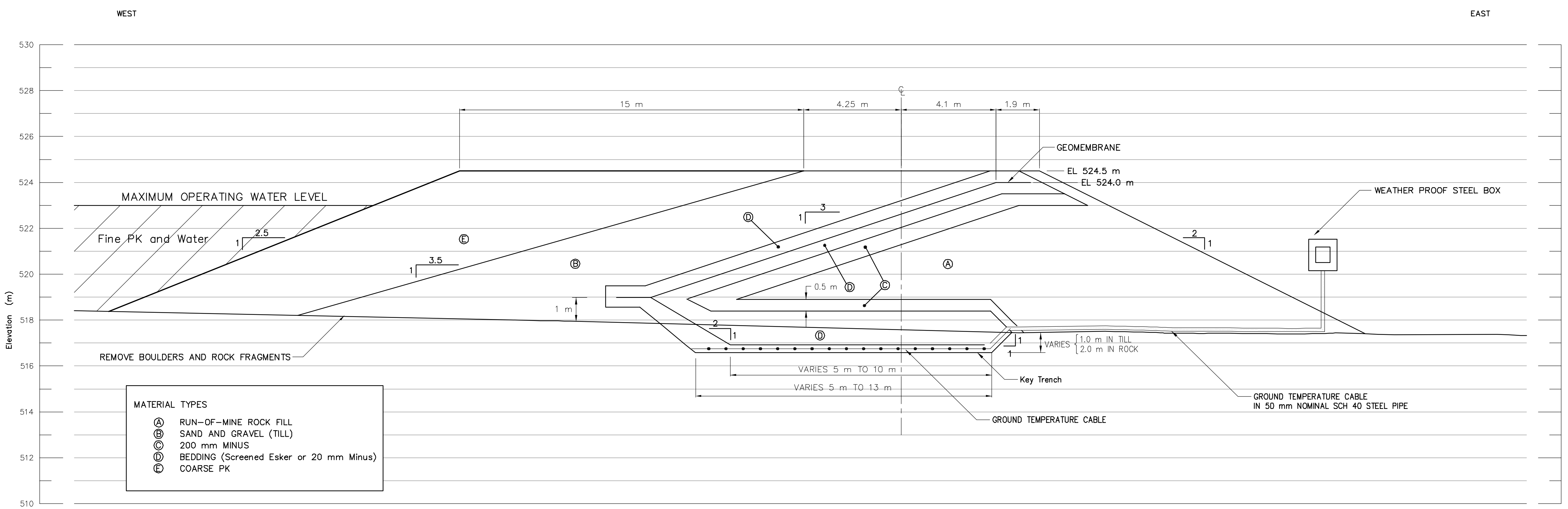


West Dam - Typical Cross-Section



East and Southeast Dams - Typical Cross-Section

0 10
metres

Figure 10
West, East and Southeast Dams Typical Cross-Sections

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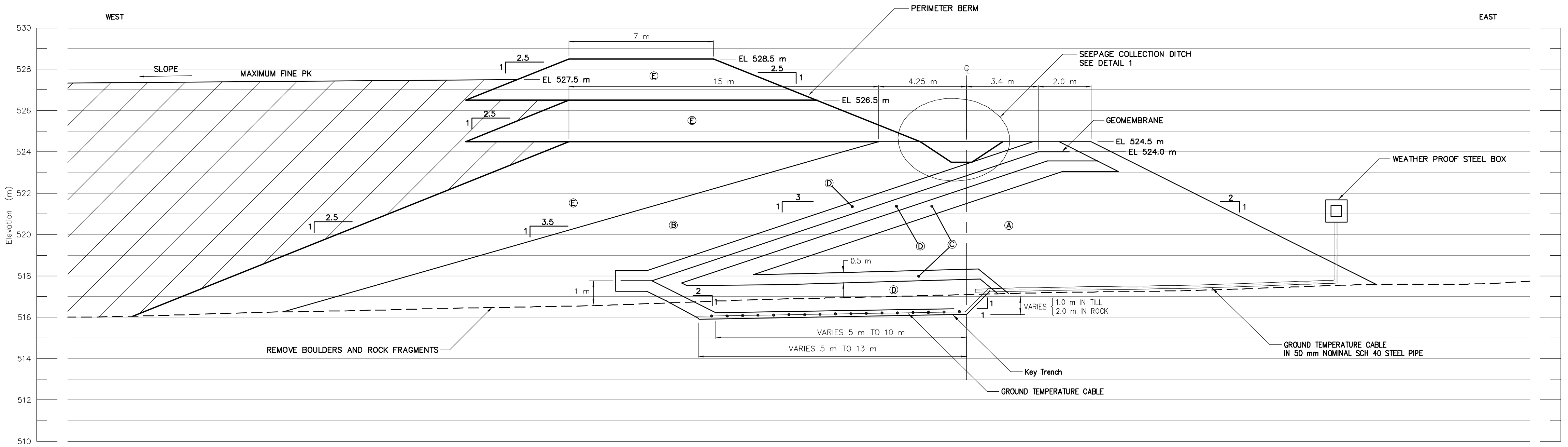
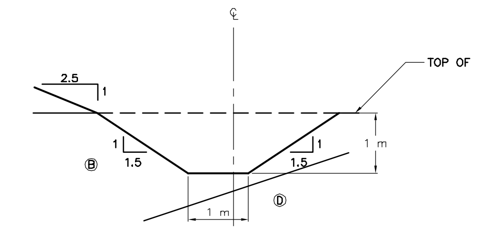


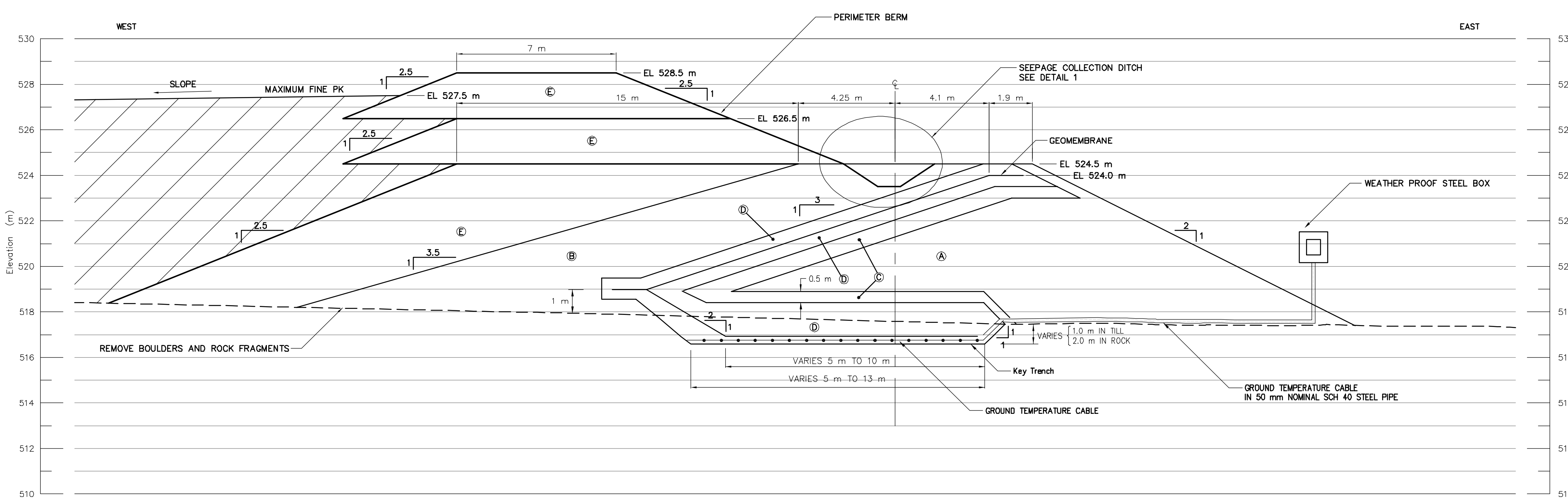
MATERIAL TYPES
- Ⓐ RUN-OF-MINE ROCK FILL
- Ⓑ SAND AND GRAVEL (TILL)
- Ⓒ 200 mm MINUS
- Ⓓ BEDDING (Screened Esker or 20 mm Minus)
- Ⓔ COARSE PK

East Dam - Cross-Section A-A



Detail 1 - Seepage Collection Ditch

N.T.S.



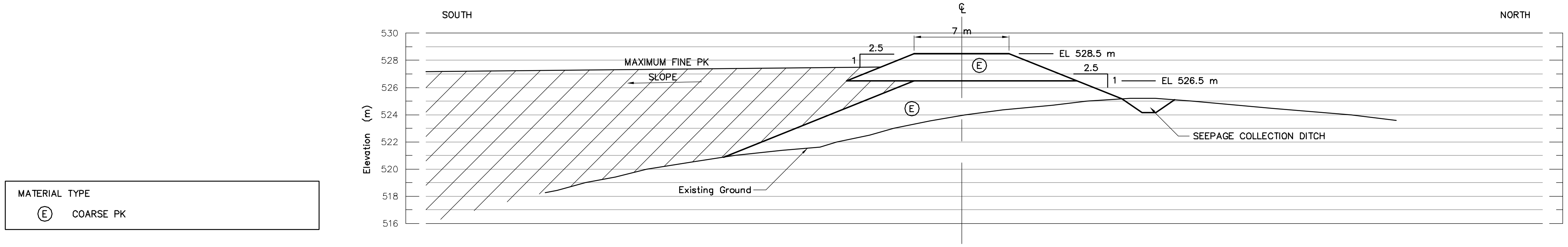
MATERIAL TYPES
- Ⓐ RUN-OF-MINE ROCK FILL
- Ⓑ SAND AND GRAVEL (TILL)
- Ⓒ 200 mm MINUS
- Ⓓ BEDDING (Screened Esker or 20 mm Minus)
- Ⓔ COARSE PK

Southeast Dam - Cross-Section B-B

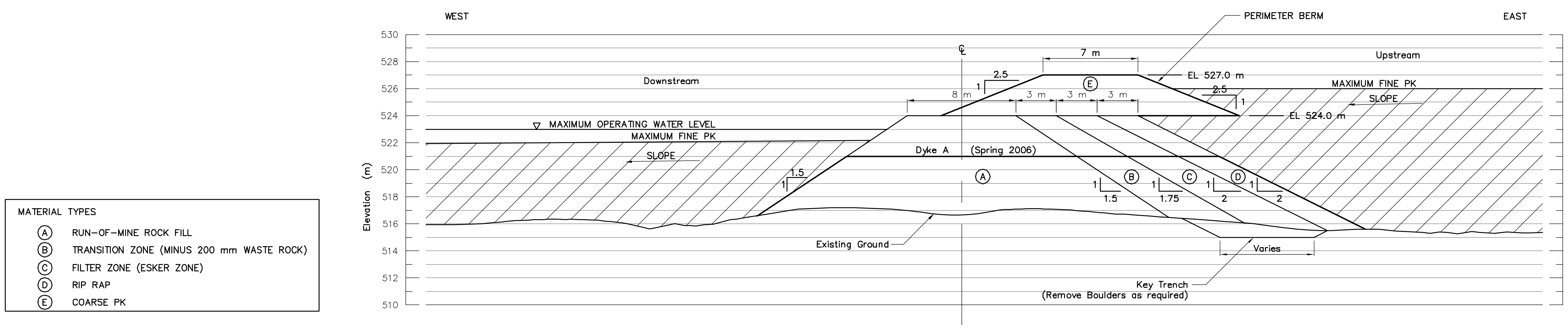
0 10
metres

Figure 11
Perimeter Berm
Typical Cross-Sections A-A and B-B

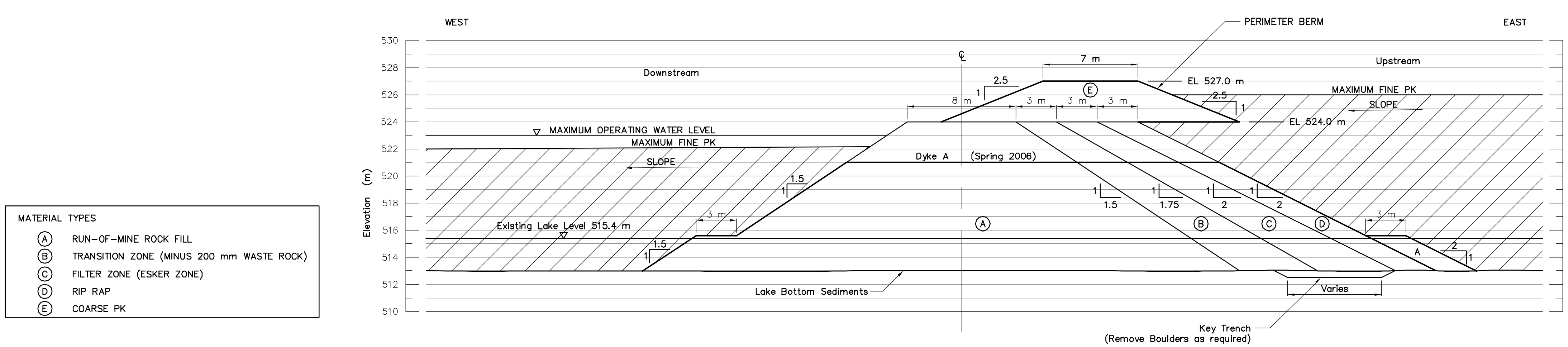
1100060004R47B.dwg



Perimeter Berm - Cross-Section C-C



Divider Dyke A - Cross-Section D-D



Divider Dyke A - Cross-Section E-E

0 20 metres

Figure 12
Perimeter Berm
Typical Cross-Sections C-C, D-D, and E-E

1100060004R48C.dwg

APPENDIX

APPENDIX A WATER BALANCE

Table A1 Summary of Monthly Water & Fine PK Balance of PKCA for Mean Precipitation Years

Month & Year	Cell A Monthly Water Balance					Cell B Monthly Water Balance						Cell C Monthly Water Balance					Monthly Fine Tailings Balance			
	Month-End Pond Elevation of Cell A	Direct Cell A Percipitation - Evaporation + Runoff from Watershed of Cell A	Runoff Water Collected from Catchments of Areas A and B, Plant Site Area, and Pit Area and Sewage into Cell A	Free Water from Tailings Placed in Cell A	Water Flowing from Cell A to Cell B (Seeping through Divider Dyke A When Fine PK Ele. In Cell A < 524.0 m)	Month-End Pond Elevation of Cell B	Direct Cell B Percipitation - Evaporation + Runoff from Watershed of Cell B	Runoff Water Collected from Catchments of Areas A and B, Plant Site Area, and Pit Area and Sewage into Cell B	Free Water from Tailings Placed in Cell B	Water Flowing from Cell A to Cell B (Seeping through Divider Dyke A When Fine PK Ele. In Cell A < 524.0 m)	Water Flowing from Cell B into Cell C (Seeping through Divider Dyke B after Jan. 2008)	Month-End Pond Elevation of Cell C	Direct Cell C Percipitation - Evaporation + Runoff from Watershed of Cell C	Warer Flowing from Cell B to Cell C (Seeping through Divider Dyke B after Jan. 2008)	Water Reclaimed from Cell C to Plant	Water Release from Cell C to Stream C3	Month-End Cumulative Volume of Fine Tailings to Cell A	Month-End Average Surface Elevation of Fine Tailings in Cell A	Month-End Cumulative Volume of Fine Tailings to Cell B	Month-End Average Surface Elevation of Fine Tailings in Cell B
	(m)	(m^3)	(m^3)	(m^3)	(m^3)	(m)	(m^3)	(m^3)	(m^3)	(m^3)	(m^3)	(m)	(m^3)	(m^3)	(m^3)	(m^3)	(m^3)	(m)	(m^3)	(m)
Dec-05	**513.87**					**512.64**						**512.64**								
Jan-06	514.20	0	804	1,601	0	512.64	0	0	0	0	-49	512.64	0	-49	0	0	4,586	512.00	0	511.00
Feb-06	514.62	0	726	2,893	0	512.64	0	0	0	0	0	512.64	0	0	0	0	12,871	513.12	0	511.00
Mar-06	515.20	0	804	4,804	0	512.64	0	0	0	0	0	512.64	0	0	0	0	26,630	514.12	0	511.00
Apr-06	515.74	0	778	6,199	0	512.64	0	0	0	0	0	512.64	0	0	0	0	44,384	514.75	0	511.00
May-06	516.36	954	4,745	6,405	0	512.76	791	0	0	0	199	512.76	1,168	199	0	0	62,729	515.26	0	511.00
Jun-06	517.67	26,591	75,672	6,199	54,407	515.18	16,076	0	0	54,407	35,117	515.18	24,266	35,117	14,164	0	80,482	515.65	0	511.00
Jul-06	517.45	3,038	21,826	6,405	62,577	514.32	2,983	0	0	62,577	82,462	514.32	5,085	82,462	14,636	92,500	98,827	516.05	0	511.00
Aug-06	517.35	2,185	13,943	6,405	46,465	513.47	2,214	0	0	46,465	60,530	513.47	3,473	60,530	14,636	64,750	117,173	516.40	0	511.00
Sep-06	517.54	5,681	17,859	6,199	36,422	513.59	3,605	0	0	36,422	38,654	513.59	5,438	38,654	14,164	27,750	134,926	516.74	0	511.00
Oct-06	517.56	546	2,117	6,405	26,146	514.40	302	0	0	26,146	14,498	514.40	452	14,498	0	0	153,271	517.08	0	511.00
Nov-06	517.71	0	778	6,199	16,307	514.81	0	0	0	16,307	8,865	514.81	0	8,865	0	0	171,025	517.39	0	511.00
Dec-06	518.13	0	804	6,405	0	514.81	0	0	0	0	0	514.81	0	0	0	0	189,370	517.71	0	511.00
Jan-07	518.53	0	804	6,405	0	514.81	0	0	0	0	0	514.81	0	0	0	0	207,715	518.03	0	511.00
Feb-07	518.88	0	726	5,785	0	514.81	0	0	0	0	0	514.81	0	0	0	0	224,285	518.28	0	511.00
Mar-07	519.22	0	804	6,405	0	514.81	0	0	0	0	0	514.81	0	0	0	0	242,630	518.56	0	511.00
Apr-07	519.53	0	778	6,199	0	514.81	0	0	0	0	0	514.81	0	0	0	0	260,384	518.83	0	511.00
May-07	519.97	579	9,482	6,405	0	514.85	647	0	0	0	-79	514.85	1,056	-79	0	0	278,729	519.09	0	511.00
Jun-07	521.02	25,839	165,670	6,199	113,549	514.47	15,994	0	0	113,549	136,359	514.47	24,201	136,359	14,164	154,800	296,482	519.31	0	511.00
Jul-07	520.69	-406	47,089	6,405	104,187	514.49	3,130	0	0	104,187	106,896	514.49	5,194	106,896	14,636	96,750	314,827	519.54	0	511.00
Aug-07	520.57	316	29,732	6,405	66,207	514.46	2,031	0	0	66,207	68,765	514.46	3,334	68,765	14,636	58,050	333,173	519.77	0	511.00
Sep-07	520.73	5,250	38,385	6,199	52,371	513.57	3,570	0	0	52,371	69,208	513.57	5,412	69,208	14,164	77,400	350,926	519.99	0	511.00
Oct-07	520.64	588	3,696	6,405	37,492	514.67	303	0	0	37,492	20,715	514.67	452	20,715	0	0	369,271	520.19	0	511.00
Nov-07	520.66	0	778	6,199	22,329	515.18	0	0	0	22,329	11,753	515.18	0	11,753	0	0	387,025	520.37	0	511.00
Dec-07	520.93	0	804	6,405	0	515.18	0	0	0	0	0	515.18	0	0	0	0	405,370	520.56	0	511.00
Jan-08	521.16	0	0	6,405	0	515.20	0	804	0	0	464	515.18	0	464	0	0	423,715	520.75	0	511.00
Feb-08	521.37	0	0	5,992	0	515.21	0	752	0	0	328	515.20	0	328	0	0	440,877	520.93	0	511.00
Mar-08	521.60	0	0	6,405	0	515.23	0	804	0	0	375	515.21	0	375	0	0	459,222	521.10	0	511.00
Apr-08	521.81	0	0	6,199	0	515.25	0	778	0	0	405	515.22	0	405	0	0	476,975	521.26	0	511.00
May-08	522.04	844	0	6,405	0	515.54	610	9,482	0	0	2,672	515.36	1,032	2,672	0	0	495,321	521.43	0	511.00
Jun-08	522.07	26,505	0	6,199	46,746	518.35	15,694	165,670	0	46,746	131,694	514.43	24,180	131,694	14,164	163,600	513,074	521.59	0	511.00
Jul-08	522.04	2,943	0	6,405	31,569	517.31	1,258	47,089	0	31,569	122,571	514.93	5,110	122,571	14,636	102,250	531,419	521.75	0	511.00
Aug-08	522.10	2,077	0	6,405	18,934	516.65	1,285	29,732	0	18,934	72,243	514.90	3,227	72,243	14,636	61,350	549,764	521.92	0	511.00
Sep-08	522.22	5,653	0	6,199	14,108	516.39	3,398	38,385	0	14,108	63,816	513.54	5,400	63,816	14,164	81,800	567,518	522.07	0	511.00
Oct-08	522.33	549	0	6,405	11,663	515.72	317	3,696	0	11,663	34,672	515.23	454	34,672	0	0	585,863	522.22	0	511.00
Nov-08	522.45	0	0	6,199	8,770	515.72	0	778	0	8,770	9,387	515.59	0	9,387	0	0	603,616	522.36	0	511.00
Dec-08	522.64	0	0	6,405	0	515.68	0	804	0	0	1,872	515.66	0	1,872	0	0	621,962	522.50	0	511.00
Jan-09	522.84	0	0	6,405	0	515.69	0	804	0	0	573	515.68	0	573	0	0	640,307	522.64	0	511.00
Feb-09	523.01	0	0	5,785	0	515.70	0	726	0	0	379	515.69	0	379	0	0	656,877	522.77	0	511.00
Mar-09	523.19	0	0	6,405	0	515.72	0	804	0	0	369	515.71	0	369	0	0	675,222	522.92	0	511.00
Apr-09	523.37	0	0	6,199	0	515.74	0	778	0	0	412	515.72	0	412	0	0	692,975	523.05	0	511.00
May-09	523.56	760	0	6,405	0	516.01	579	9,482	0	0	2,969	515.87	1,008	2,969	0	0	711,321	523.19	0	511.00
Jun-09	523.60	26,367	0	6,199	44,345	518.52	15,650	165,670	0	44,345	133,274	514.87	24,137	133,274	14,164	169,200	729,074	523.32	0	511.00
Jul-09	523.60	2,336	0	6,405	27,048	517.40	1,153	47,089	0	27,048	122,584	515.16	4,972	122,584	14,636	105,750	747,419	523.46	0	511.00
Aug-09	523.68	1,728	0	6,405	15,913	516.66	1,266	29,732	0	15,913	72,281	515.06	3,183	72,281	14,636	63,450	765,764	523.59	0	511.00
Sep-09	523.81	5,575	0	6,199	12,675	516.39	3,397	38,385	0	12,675	62,850	513.54	5,396	62,850	14,164	84,600	783,518	523.72	0	511.00
Oct-09	523.92	556	0	6,405	10,474	515.69	317	3,696	0	10,474	34,145	515.21	454	34,145	0	0	801,863	523.86	0	511.00
Nov-09	524.04	0	0	6,199	7,588	515.67	0	778	0	7,588	8,901	515.55	0	8,901	0	0	819,616	523.99	0	511.00
Dec-09	524.12	0	0	6,405	13,663	515.97	0	804	0	13,663	8,156	515.85	0	8,156	0	0	837,962	524.12	0	511.00

Table A1 Summary of Monthly Water & Fine PK Balance of PKCA for Mean Precipitation Years

	Cell A Monthly Water Balance					Cell B Monthly Water Balance						Cell C Monthly Water Balance					Monthly Fine Tailings Balance			
Month & Year	Month-End Pond Elevation of Cell A	Direct Cell A Percipitation - Evaporation + Runoff from Watershed of Cell A	Runoff Water Collected from Catchments of Areas A and B, Plant Site Area, and Pit Area and Sewage into Cell A	Free Water from Tailings Placed in Cell A	Water Flowing from Cell A to Cell B (Seeping through Divider Dyke A When Fine PK Ele. In Cell A < 524.0 m)	Month-End Pond Elevation of Cell B	Direct Cell B Percipitation - Evaporation + Runoff from Watershed of Cell B	Runoff Water Collected from Catchments of Areas A and B, Plant Site Area, and Pit Area and Sewage into Cell B	Free Water from Tailings Placed in Cell B	Water Flowing from Cell A to Cell B (Seeping through Divider Dyke A When Fine PK Ele. In Cell A < 524.0 m)	Water Flowing from Cell B into Cell C (Seeping through Divider Dyke B after Jan. 2008)	Month-End Pond Elevation of Cell C	Direct Cell C Percipitation - Evaporation + Runoff from Watershed of Cell C	Warer Flowing from Cell B to Cell C (Seeping through Divider Dyke B after Jan. 2008)	Water Reclaimed from Cell C to Plant	Water Release from Cell C to Stream C3	Month-End Cumulative Volume of Fine Tailings to Cell A	Month-End Average Surface Elevation of Fine Tailings in Cell A	Month-End Cumulative Volume of Fine Tailings to Cell B	Month-End Average Surface Elevation of Fine Tailings in Cell B
	(m)	(m^3)	(m^3)	(m^3)	(m^3)	(m)	(m^3)	(m^3)	(m^3)	(m^3)	(m^3)	(m)	(m^3)	(m^3)	(m^3)	(m^3)	(m^3)	(m)	(m^3)	(m)
Jan-10	524.26	0	0	6,405	5,348	516.06	0	804	0	5,348	3,555	515.99	0	3,555	0	0	856,307	524.26	0	511.00
Feb-10	524.38	0	0	5,785	5,724	516.17	0	726	0	5,724	3,056	516.09	0	3,056	0	0	872,877	524.38	0	511.00
Mar-10	524.51	0	0	6,405	6,734	516.30	0	804	0	6,734	3,494	516.20	0	3,494	0	0	891,222	524.51	0	511.00
Apr-10	524.64	0	0	6,199	5,935	516.41	0	778	0	5,935	3,605	516.32	0	3,605	0	0	908,975	524.64	0	511.00
May-10	524.77	1,453	0	6,405	8,187	516.77	534	9,482	0	8,187	6,983	516.58	981	6,983	0	0	927,321	524.77	0	511.00
Jun-10	524.90	27,608	0	6,199	33,543	518.76	15,583	165,670	0	33,543	134,474	515.51	24,084	134,474	14,164	175,200	945,074	524.90	0	511.00
Jul-10	525.03	7,750	0	6,405	14,437	517.48	1,021	47,089	0	14,437	118,019	515.46	4,793	118,019	14,636	109,500	963,419	525.03	0	511.00
Aug-10	525.16	4,844	0	6,405	11,377	516.67	1,249	29,732	0	11,377	70,576	515.21	3,134	70,576	14,636	65,700	981,764	525.16	0	511.00
Sep-10	525.29	6,297	0	6,199	12,032	516.38	3,397	38,385	0	12,032	62,540	513.57	5,391	62,540	14,164	87,600	999,518	525.29	0	511.00
Oct-10	525.42	484	0	6,405	7,018	515.61	316	3,696	0	7,018	32,614	515.18	454	32,614	0	0	1,017,863	525.42	0	511.00
Nov-10	525.54	0	0	6,199	7,136	515.60	0	778	0	7,136	8,084	515.48	0	8,084	0	0	1,035,616	525.54	0	511.00
Dec-10	525.67	0	0	6,405	6,534	515.74	0	804	0	6,534	3,890	515.63	0	3,890	0	0	1,053,962	525.67	0	511.00
Jan-11	525.81	0	0	6,405	5,132	515.84	0	804	0	5,132	3,344	515.75	0	3,344	0	0	1,072,307	525.81	0	511.00
Feb-11	525.92	0	0	5,785	6,941	516.00	0	726	0	6,941	3,415	515.88	0	3,415	0	0	1,088,877	525.92	0	511.00
Mar-11	526.05	0	0	6,405	6,510	516.13	0	804	0	6,510	3,387	516.01	0	3,387	0	0	1,107,222	526.05	0	511.00
Apr-11	526.18	0	0	6,199	5,673	516.23	0	778	0	5,673	3,450	516.12	0	3,450	0	0	1,124,975	526.18	0	511.00
May-11	526.31	1,453	0	6,405	7,925	516.59	545	9,482	0	7,925	7,009	516.38	989	7,009	0	0	1,143,321	526.31	0	511.00
Jun-11	526.44	27,608	0	6,199	33,282	518.63	15,607	165,670	0	33,282	134,508	515.15	24,106	134,508	14,164	178,800	1,161,074	526.44	0	511.00
Jul-11	526.57	7,750	0	6,405	14,221	517.30	1,139	47,089	0	14,221	118,619	515.04	4,939	118,619	14,636	111,750	1,179,419	526.57	0	511.00
Aug-11	526.57	4,844	0	0	4,844	516.89	1,253	29,732	6,405	4,844	74,093	514.84	3,222	74,093	14,636	67,050	1,179,419	526.57	18,345	513.97
Sep-11	526.57	6,297	0	0	6,297	516.85	3,375	38,385	6,199	6,297	73,026	513.56	5,401	73,026	14,164	89,400	1,179,419	526.57	36,099	514.96
Oct-11	526.57	484	0	0	484	516.69	321	3,696	6,405	484	34,349	515.23	454	34,349	0	0	1,179,419	526.57	54,444	515.69
Nov-11	526.57	0	0	0	0	516.97	0	778	6,199	0	16,203	515.84	0	16,203	0	0	1,179,419	526.57	72,197	516.33
Dec-11	526.57	0	0	0	0	517.56	0	804	6,405	0	3,556	515.97	0	3,556	0	0	1,179,419	526.57	90,542	516.93
Jan-12	526.57	0	0	0	0	518.18	0	804	6,405	0	294	515.98	0	294	0	0	1,179,419	526.57	108,888	517.43
Feb-12	526.57	0	0	0	0	518.69	0	752	5,992	0	0	515.98	0	0	0	0	1,179,419	526.57	126,049	517.89
Mar-12	526.57	0	0	0	0	519.18	0	804	6,405	0	0	515.98	0	0	0	0	1,179,419	526.57	144,395	518.30
Apr-12	526.57	0	0	0	0	519.60	0	778	6,199	0	0	515.98	0	0	0	0	1,179,419	526.57	162,148	518.67
May-12	526.57	1,453	0	0	1,453	520.17	200	9,482	6,405	1,453	0	516.02	998	0	0	0	1,179,419	526.57	180,493	519.05
Jun-12	526.57	27,608	0	0	27,608	521.17	15,020	165,670	6,199	27,608	159,346	515.96	24,083	159,346	14,164	170,800	1,179,419	526.57	198,247	519.35
Jul-12	526.57	7,750	0	0	7,750	520.66	-1,428	47,089	6,405	7,750	116,423	515.95	4,617	116,423	14,636	106,750	1,179,419	526.57	216,592	519.66
Aug-12	526.57	4,844	0	0	4,844	520.60	-463	29,732	6,405	4,844	63,218	515.48	3,053	63,218	14,636	64,050	1,179,419	526.57	234,937	519.97
Sep-12	526.57	6,297	0	0	6,297	520.85	2,951	38,385	6,199	6,297	53,323	513.59	5,384	53,323	14,164	85,400	1,179,419	526.57	252,690	520.22
Oct-12	526.57	484	0	0	484	520.79	365	3,696	6,405	484	33,942	515.24	454	33,942	0	0	1,179,419	526.57	271,036	520.48
Nov-12	526.57	0	0	0	0	520.90	0	778	6,199	0	16,907	515.87	0	16,907	0	0	1,179,419	526.57	288,789	520.73
Dec-12	526.57	0	0	0	0	521.23	0	804	6,405	0	0	515.87	0	0	0	0	1,179,419	526.57	307,134	520.98

APPENDIX

APPENDIX B FLOCCULANT DATA SHEETS

MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION OF THE PRODUCT AND THE COMPANY

Product name : **FLO POLYMER CV4120B**

Company : **SNF INC**

PO BOX 250

Riceboro, GA 31324

Telephone number : 912-884-3366 ***Fax :*** 912-884-5031

Product Use : Process aid for industrial applications.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Identification of the preparation : Cationic water-soluble polymer

Components		*CAS-No*	*Weight %*
Polydiallyldimethylammonium chloride (PolyDADMAC)	R52/53	26062-79-3	> 85

3. HAZARDS IDENTIFICATION

Aqueous solutions or powders that become wet render surfaces extremely slippery.

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

4. FIRST AID MEASURES

Inhalation : No hazards which require special first aid measures.

Skin contact : No hazards which require special first aid measures. Wash with water and soap as a precaution. In case of persistent skin irritation, consult a physician.

Eye contact : Rinse thoroughly with plenty of water, also under the eyelids. In case of persistent eye irritation, consult a physician.

Ingestion : No hazards which require special first aid measures. The product is not considered toxic based on studies on laboratory animals.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : water, water spray, foam, carbon dioxide (CO2), dry powder

Fire extinguishing agents to avoid : None.

Special fire-fighting precautions : Aqueous solutions or powders that become wet render surfaces extremely slippery.

Special protective equipment for firefighters : No special protective equipment required..

6. ACCIDENTAL RELEASE MEASURES

Personal precautions : No special precautions required.

Environmental precautions : Do not contaminate water.

Methods for cleaning up : Do not flush with water. Clean up promptly by scoop or vacuum. Keep in suitable and closed containers for disposal. After cleaning, flush away traces with water.

7. HANDLING AND STORAGE

Handling : Avoid contact with skin and eyes. Avoid dust formation. Do not breathe dust. Wash hands before breaks and at the end of workday.

Storage : Keep in a dry, cool place (0 - 35°C).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures to reduce exposure: Use local exhaust if dusting occurs. Natural ventilation is adequate in absence of dusts.

Personal protection equipment

- ***Respiratory protection :*** Dust safety masks are recommended where concentration of total dust is more than 10 $mg/m^{3.}$
- ***Hand protection :*** Rubber gloves.
- ***Eye protection :*** Safety glasses with side-shields. Do not wear contact lenses.
- ***Skin and body protection :*** Chemical resistant apron or protective suit if splashing or repeated contact with solution is likely.

Hygiene measures : Wash hands before breaks and at the end of workday. Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form : granular solid

Colour : white

Odour : slight

pH : 2.5 - 4.5 @ 5g/l for product series. See Technical Bulletin for specific value.

Melting point (°C) : Not applicable.

Flash point (°C) : Not applicable.

Autoignition temperature (°C) : Not applicable.

Vapour pressure (mm Hg) : Not applicable.

Bulk density : See Technical Bulletin.

Water solubility : See Technical Bulletin.

Viscosity (mPa.s) : See Technical Bulletin.

10. STABILITY AND REACTIVITY

Stability : Product is stable, no hazardous polymerization will occur.

Materials to avoid : Oxidizing agents may cause exothermic reactions.

Hazardous decomposition products : Thermal decomposition may produce : hydrogen chloride gas, nitrogen oxides (NOx), carbon oxides.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

- Oral : Based on studies on similar products, this material is not expected to be toxic.

- Dermal : Based on studies on similar products, this material is not expected to be toxic.

- Inhalation : Based on studies on similar products, this material is not expected to be toxic.

Irritation

- Skin : By analogy with similar products, this product is not expected to be irritating.

- Eyes : By analogy with similar products tested according to the Draize technique this material should produce no corneal or iridial effects and only slight transitory conjuctival effects similar to those which all granular materials have on conjuctivae.

Sensitization : By analogy with similar products, this product is not expected to be sensitizing.

Chronic toxicity : By analogy with similar products, this product is not expected to demonstrate chronic toxic effects.

12. ECOLOGICAL INFORMATION

Acute aquatic toxicity

- Fish : LC50/*Danio rerio* /96 hours > 10 mg/L (OECD 203) (Based on results obtained from tests on analogous products.)

- Daphnids : EC50/*Daphnia magna* /48 hours > 10 mg/L (OECD 202) (Based on results obtained from tests on analogous products.)

- Algae : Algal inhibition tests are not appropriate. The flocculating characteristics of the product interfere directly in the test medium preventing homogenous distribution which invalidates the test.

- Hydrolysis: Does not hydrolyse.

- Biodegradation: Not readily biodegradable.

- LogP$_{OW}$: 0

- Bioaccumulation : Does not bioaccumulate.

Other ecological information

The effects of this product on aquatic organisms are rapidly and significantly mitigated by the presence of dissolved organic carbon in the aquatic environment.

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products : In accordance with local and national regulations.

Contaminated packaging : Rinse empty containers with water and use the rinse water to prepare the working solution. Can be landfilled or incinerated, when in compliance with local regulations.

14. TRANSPORT INFORMATION

Remarks : Not classified as dangerous in the meaning of transport regulations.

15. REGULATORY INFORMATION

The product is classified and labelled in accordance with EC directives or respective national laws.

R -phrase(s) : R52/53 - Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S -phrase(s) : S61 -Avoid release to the environment. Refer to special instructions/Safety data sheets.

Inventory status :

EINECS (Europe) : Existing polymer according to the definition in the 7th Amendment to Directive 67/548/EEC. All starting materials and additives are listed in EINECS.

TSCA (USA) : Complies with all applicable rules or orders under TSCA.

16. OTHER INFORMATION

Further information :

This MSDS was prepared in accordance with the following:

Council Directive 92/32/EEC of 30 April 1992 amending for the seventh time Directive 67/548/EEC on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances and all subsequent adaptations to technical progress

Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations

Commission Directive 2001/58/EC of 27 July 2001 amending for the second time Directive 91/155/EEC defining and laying down the detailed arrangements for the system of specific information relating to dangerous preparations in implementation of Article 14 of European Parliament and Council Directive 1999/45/EC and relating to dangerous substances in implementation of Article 27 of Council Directive 67/548/EEC (safety data sheets)

ISO 11014-1: Material Safety Data Sheet for Chemical Products.

Person to contact : Regulatory Affairs

MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION OF THE PRODUCT AND THE COMPANY

FLO POLYMER AE 4500

Supplier :

SNF INC

PO Box 250

Riceboro, Georgia 31323

Tel : 912-884-3366 Fax : 912-884-5031

2. COMPOSITION/INFORMATION ON INGREDIENTS

Identification of the preparation : Anionic water-soluble polymer

3. HAZARDS IDENTIFICATION

Aqueous solutions or powders that become wet render surfaces extremely slippery

4. FIRST AID MEASURES

Inhalation : Move to fresh air.

Skin contact : Wash with water and soap as a precaution. In case of persistent skin irritation, consult a physician

Eye contact : Rinse thoroughly with plenty of water, also under the eyelids. In case of persistent eye irritation, consult a physician.

Ingestion : The product is not considered toxic based on studies on laboratory animals

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Water, water spray, foam, carbon dioxide (CO2), dry powder

Special fire-fighting precautions : Aqueous solutions or powders that become wet render surfaces extremely slippery

Protective equipment for firefighters : No special protective equipment required.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions : No special precautions required.

Environmental precautions : Do not contaminate water.

Methods for cleaning up : Do not flush with water. Clean up promptly by sweeping or vacuum. Keep in suitable and closed containers for disposal. After cleaning, flush away traces with water.

7. HANDLING AND STORAGE

Handling : Avoid contact with skin and eyes. Avoid dust formation. Do not breathe dust. Wash hands before breaks and at the end of workday.

Storage : Keep in a dry, cool place (0-35ˆ°ˆC).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls : Use local exhaust if dusting occurs. Natural ventilation is adequate in absence of dusts

<u>Personal protection equipment</u>

- ***Respiratory protection :*** Dust safety masks are recommended where concentration of total dust is more than 10 mg/m^3
- ***Hand protection :*** Rubber gloves.
- ***Eye protection :*** Safety glasses with side-shields. Do not wear contact lenses.
- ***Skin protection :*** Chemical resistant apron or protective suit if splashing or contact with solution is likely.

Hygiene measures : Wash hands before breaks and at the end of workday.Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form : granular solid

Color : white

Odor : none

pH : 4-9 @ 5 g/l

Melting point (°C) : Not applicable

Flash point (°C) : Not applicable

Autoignition temperature (°C) : Not applicable

Vapour pressure (mm Hg) : Not applicable

Bulk density : See Technical Bulletin

Water solubility : See Technical Bulletin

Viscosity (mPa s) : See Technical Bulletin

10. STABILITY AND REACTIVITY

Stability : Product is stable. No hazardous polymerization will occur.

Conditions to avoid : Oxidizing agents may cause exothermic reactions

Hazardous decomposition products : Thermal decomposition may produce: nitrogen oxides (NOx), carbon oxides

11. TOXICOLOGICAL INFORMATION

Acute toxicity

- Oral : LD50/oral/rat > 5000 mg/kg

- Dermal : The results of testing on rabbits showed this material to be non-toxic even at high dose levels.

- Inhalation : The product is not expected to be toxic by inhalation.

Irritation

- Skin : The results of testing on rabbits showed this material to be non-irritating to the skin.

- Eyes : Testing conducted according to the Draize technique showed the material produces no corneal or iridial effects and only slight transitory conjuctival effects similar to those which all granular materials have on conjuctivae.

Sensitization : The results of testing on guinea pigs showed this material to be non-sensitizing.

Chronic toxicity : A two-year feeding study on rats did not reveal adverse health effects. A two-year feeding study on dogs did not reveal adverse health effects.

12. ECOLOGICAL INFORMATION

- Fish LC50/Danio rerio/96 hr > 100 mg/L (OECD 203) (Based on results obtained from tests of analogous products.)

- Algae : IC50/Scenedesmus subspicatus/72hr > 100 mg/L (OECD 201) (Based on results obtained from tests of analogous products.)

- Daphnia : EC50 /Daphnia magna/48 hr > 100 mg/L (OECD 202) (Based on results obtained from tests of analogous products.)

Bioaccumulation : Does not bioaccumulate.

Persistence / degradability : Not readily biodegradable.

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products : In accordance with federal, state and local regulations.

Contaminated packaging : Rinse empty containers with water and use the rinse water to prepare the working solution. Can be landfilled or incinerated, when in compliance with local regulations.

14. TRANSPORT INFORMATION

Not regulated by DOT.

15. REGULATORY INFORMATION

All components of this product are on the TSCA and DSL inventories

RCRA status : Not a hazardous waste.

Hazardous waste number : Not applicable

Reportable quantity (40 CFR 302) : Not applicable

Threshold planning quantity (40 CFR 355) Not applicable

California Proposition 65 information : The following statement is made in order to comply with the CA Safe Drinking Water and Toxic Enforcement Act of 1986: This product contains a chemical known to the State of California to cause cancer: residual acrylamide.

HMIS & NFPA Ratings	HMIS	NFPA
Health :	1	1
Flammability :	1	1
Reactivity :	0	0

16. OTHER INFORMATION

Person to contact : Regulatory Affairs Manager

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release, and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process unless specified in the text.

APPENDIX

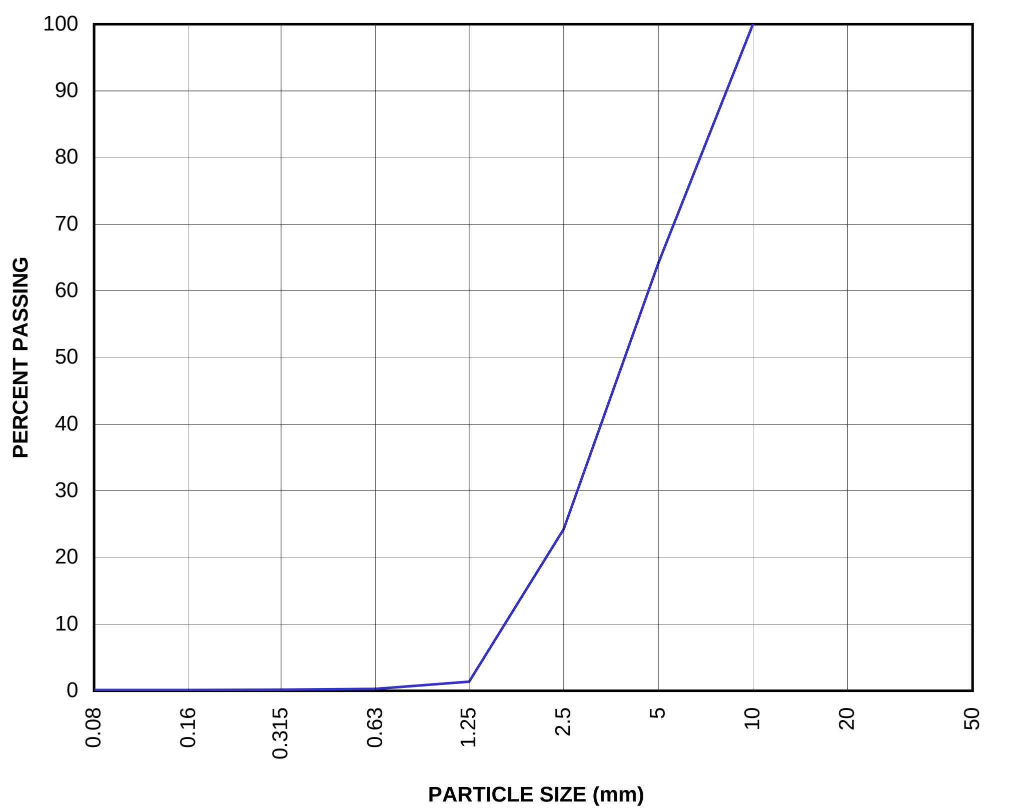
APPENDIX C COARSE PK GEOTECHNICAL TEST RESULTS

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

PROJECT:	PKCA Dams	SAMPLE NO:	Tailings_Coarse_007
ADDRESS:	Jericho Diamond Project	SAMPLE DESCRIPTION:	
PROJECT NO:	0101-04-1100060.007	Coarse Tailings from PP without HPGR	
DATE TESTED:	Feb 13/06 By: MM		
CLIENT:	Tahera Diamond Corp.	NAT. MOISTURE CONT.:	13.7%
		COLOUR PLATE #:	n/a
		BULK REL DENSITY:	n/a
ATTENTION:	Roland Jones/Harold Gates	BULK REL. DENSITY (SSD):	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
10	100
5	64
2.5	24
1.25	1
0.630	0
0.315	0
0.160	0.1
0.080	0.1



Remarks: Coarse tailings sample without HPGR running was produced by the Process Plant.

Reviewed by: ____________________

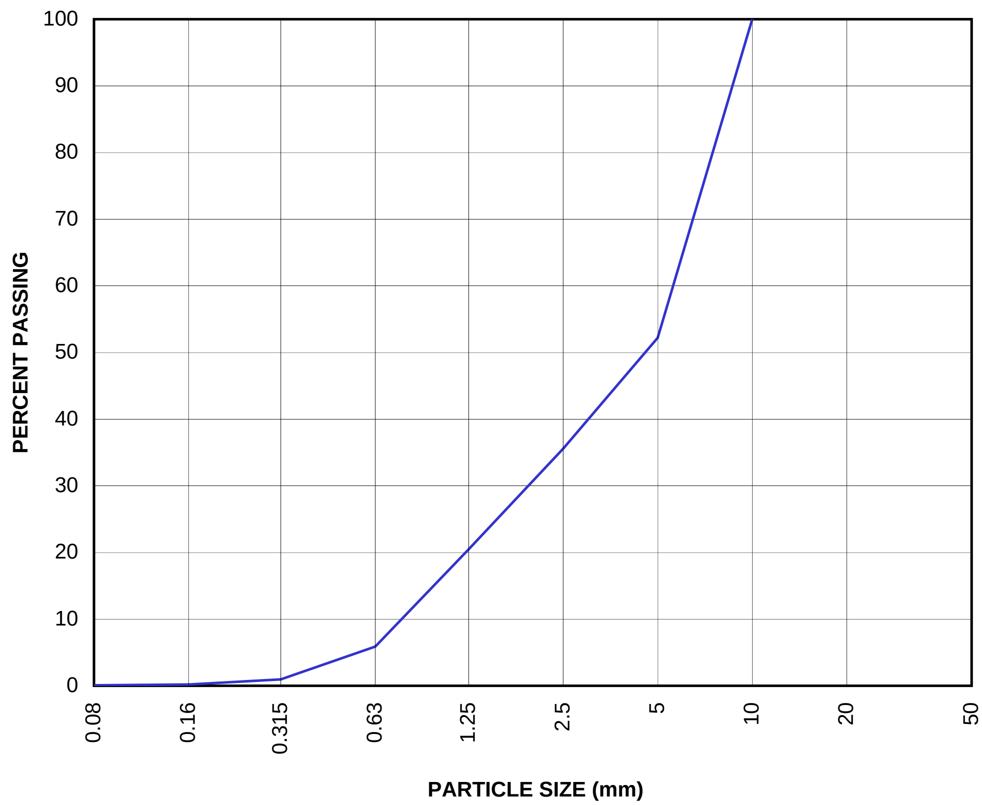
eba

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

PROJECT:	PKCA Dams	SAMPLE NO:	Tailings_Coarse_006
ADDRESS:	Jericho Diamond Project	SAMPLE DESCRIPTION:	
PROJECT NO:	0101-04-1100060.007		Coarse Tailings from PP with HPGR
DATE TESTED:	Feb 13/06 By: MM		
CLIENT:	Tahera Diamond Corp.	NAT. MOISTURE CONT.:	10.9%
		COLOUR PLATE #:	n/a
		BULK REL DENSITY:	n/a
ATTENTION:	Roland Jones/Harold Gates	BULK REL. DENSITY (SSD):	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
10	100
5	52
2.5	36
1.25	20
0.630	6
0.315	1
0.160	0.2
0.080	0.1



Remarks: Coarse tailings sample with HPGR running was produced by the Process Plant.

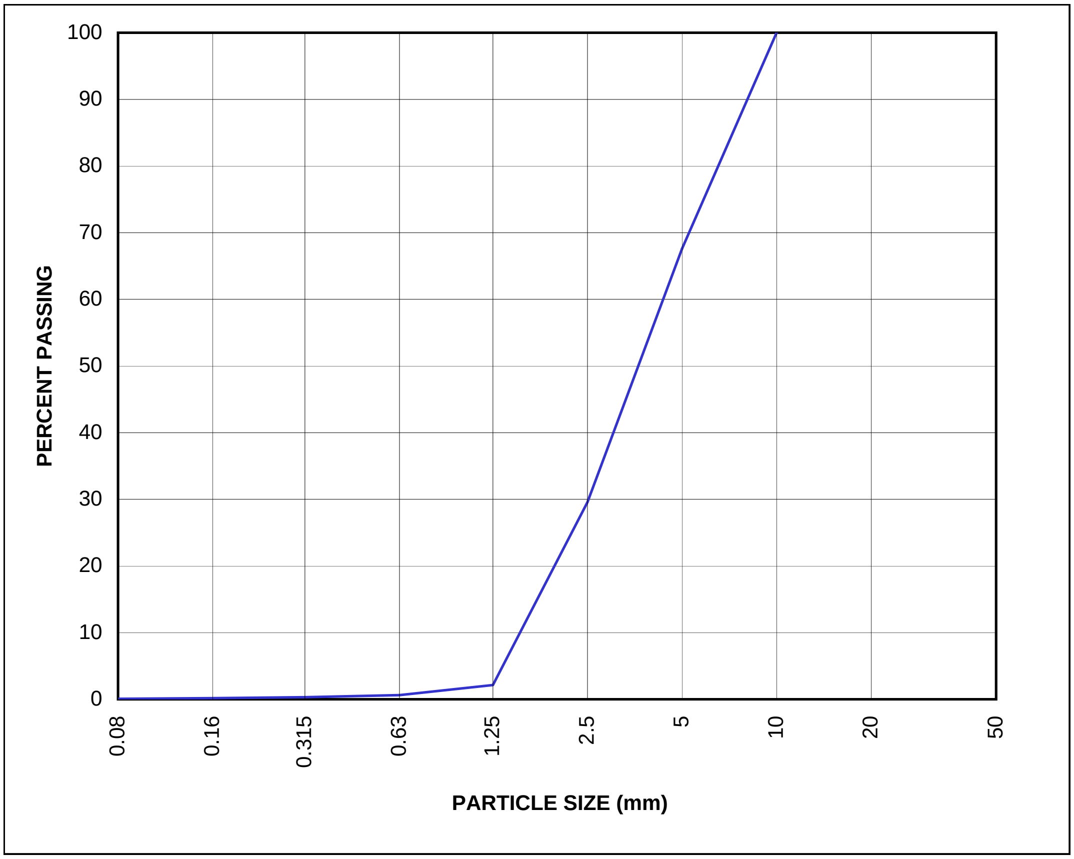
Reviewed by: ______________________

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

PROJECT:	PKCA Dams	SAMPLE NO:	Tailings_Coarse_005
ADDRESS:	Jericho Diamond Project	SAMPLE DESCRIPTION:	
PROJECT NO:	0101-04-1100060.007	Coarse Tailings from PP without HPGR	
DATE TESTED:	Feb 13/06 By: MM		
CLIENT:	Tahera Diamond Corp.	NAT. MOISTURE CONT.:	8.1%
		COLOUR PLATE #:	n/a
		BULK REL DENSITY:	n/a
ATTENTION:	Roland Jones/Harold Gates	BULK REL. DENSITY (SSD):	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
10	100
5	68
2.5	30
1.25	2
0.630	1
0.315	0
0.160	0.2
0.080	0.1



Remarks: Coarse tailings sample without HPGR running was produced by the Process Plant.

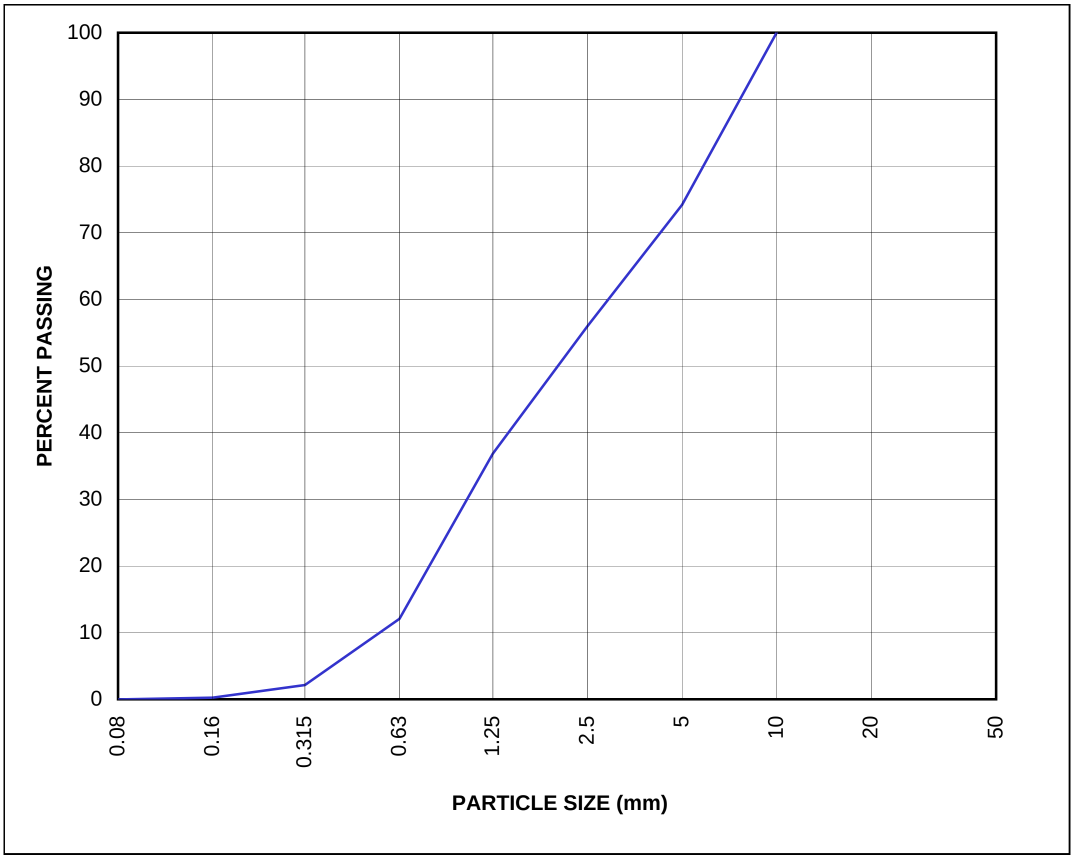
Reviewed by: ______________________

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

PROJECT:	PKCA Dams	SAMPLE NO:	Tailings_Coarse_008
ADDRESS:	Jericho Diamond Project	SAMPLE DESCRIPTION:	
PROJECT NO:	0101-04-1100060.007	Coarse Tailings from PP with HPGR	
DATE TESTED:	Feb 13/06 By: PEP		
CLIENT:	Tahera Diamond Corp.	NAT. MOISTURE CONT.:	14.9%
		COLOUR PLATE #:	n/a
		BULK REL DENSITY:	n/a
ATTENTION:	Roland Jones/Harold Gates	BULK REL. DENSITY (SSD):	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
10	100
5	74
2.5	56
1.25	37
0.630	12
0.315	2
0.160	0.2
0.080	0.0



Remarks: Coarse tailings sample with HPGR running was produced by the Process Plant.

Reviewed by: ______________________

EBA Engineering Consultants Ltd.

Relative Density and Absorption of Fine Aggregate

(CSA Designation A23.2-6A)

Project: Jericho Project
EBA Project No.: 0101-1100060.004
Sample No.: 739

Test Date: 8-Feb-06
Technician: RR
Office: Edmonton

SPECIFIC GRAVITY (-5000 mm)

TRIAL NO.		1		2
Pychnometer		6		7
Mass of Pychnometer, g		167.1		165.9
Mass of Pychnometer filled with Water, g	B	664.2		663.2
Mass of Pychnometer, SSD Fine Aggregate, g		669.7		665.5
Mass of Saturated Surface-Dry Fine Aggregate, g	M_f	502.6		499.6
Mass of Pychnometer, Aggregate and Water, g	C	972.7		970.5
Tare I.D.		e		a
Mass of Oven Dry Aggregate & Tare, g		1773.8		1386.3
Tare, g		1286.9		902.7
Mass of Oven Dry Aggregate, g	A	486.9		483.6

		Trial 1	Trial 2	Average
BULK RELATIVE DENSITY	$A/(B+M_f-C)$	2.509	2.515	**2.51**
BULK RELATIVE DENSITY S.S.D.	Mf/(B+Mf-C)	2.589	2.598	**2.59**
APPARENT RELATIVE DENSITY	A/(B+A-C)	2.729	2.743	**2.74**
ABSORPTION	(B-A)/A*100	3.22	3.31	**3.3**

eba

EBA Engineering

Micro-Deval Abrasion of Fine Aggregate
CAN/CSA A23.2 - 23A

Project No: 1100060.004
Project: Jericho Project
Client : Tahera Diamond Corporation

Attention: Harold Gates Fax:

Date Sampled: 31-Jan-06
Sampled By: JP
Date Tested: 8-Feb-06
Tested By: RR

Sample:
Sample Description: 12.5 mm crushed aggregate
Source: Coarse PK #1
Sample Location:

Initial Weight (g): 501.8
Final Weight (g): 427.4
Weight Loss (g): 74.4
Loss (%): 14.8%

Comments: CSA A23.2, Table 12: Maximum Abrasion Loss 20%

Reviewed By: ____________________ P. Eng.

EBA Engineering Consultants Ltd.

Micro-Deval Abrasion of Coarse Aggregate
CAN/CSA A23.2 - 29A

Project No: 1100060.004
Project: Jericho Project
Client : Tahera Diamond Corporation

Date Sampled: 31-Jan-06
Sampled By: JP
Date Tested: 8-Feb-06
Tested By: RR

Attention: Harold Gates Fax:

Sample: # 739
Sample Description: 12.5 mm crushed aggrgate
Source: Coarse PK # 1
Sample Location:

Initial Weight (g): 1504.6
Final Weight (g): 1340
Weight Loss (g): 164.6
Loss (%): 10.9%

Comments: CSA A23.2-04, Table 12: Maximum Abrasion Loss 17%

Reviewed By: ______________________ P. Eng.

EBA Engineering Consultants Ltd.

CONSTANT HEAD PERMEABILITY TEST **JERICHO DIAMOND MINE**

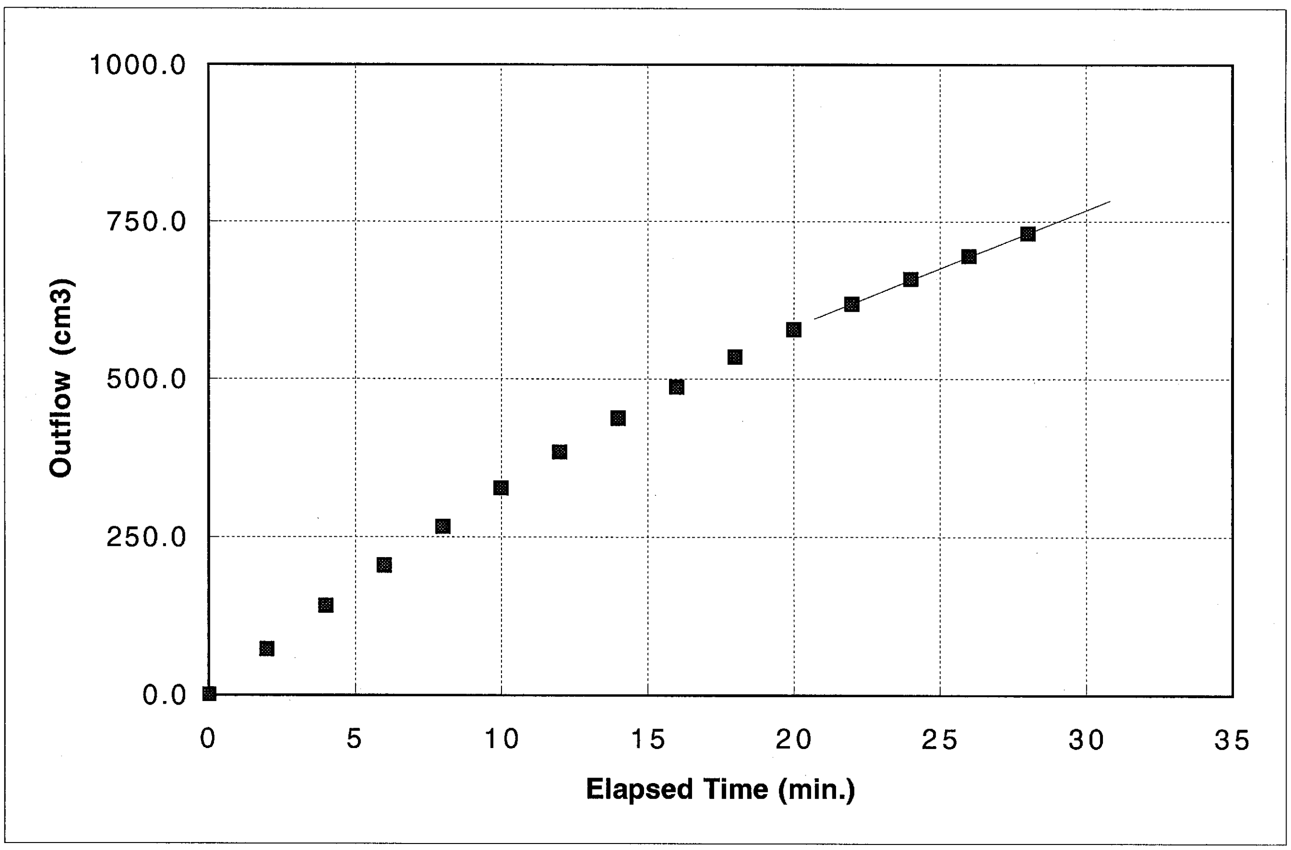
Job Number: 1100060.004
Sample No.: 739 Coarse PK #1

Date: 06-02-20
Test No: P-1

Time	Buret (cc)	Elap. (min)	Outflow (cc)
9:22	0.0	0	0.0
9:24	71.5	2	71.5
9:26	140.7	4	140.7
9:28	204.1	6	204.1
9:30	266.3	8	266.3
9:32	326.6	10	326.6
9:34	383.7	12	383.7
9:36	437.4	14	437.4
9:38	487.3	16	487.3
9:40	534.3	18	534.3
9:42	578.1	20	578.1
9:44	618.8	22	618.8
9:46	657.5	24	657.5
9:48	694.6	26	694.6
9:50	730.5	28	730.5

Diameter=	88.9	mm
Height=	88.6	mm
Volume=	549.95	cm^3
Head Diff.=	0.044	psi
Q=	0.31	cm^3/sec
i=	0.35	
A=	62.07	cm^2

K= 1.43E-02 cm/sec



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EBA Engineering Consultants Ltd.

MOISTURE - DENSITY RELATIONSHIP

ASTM D698, D1557, or D2049

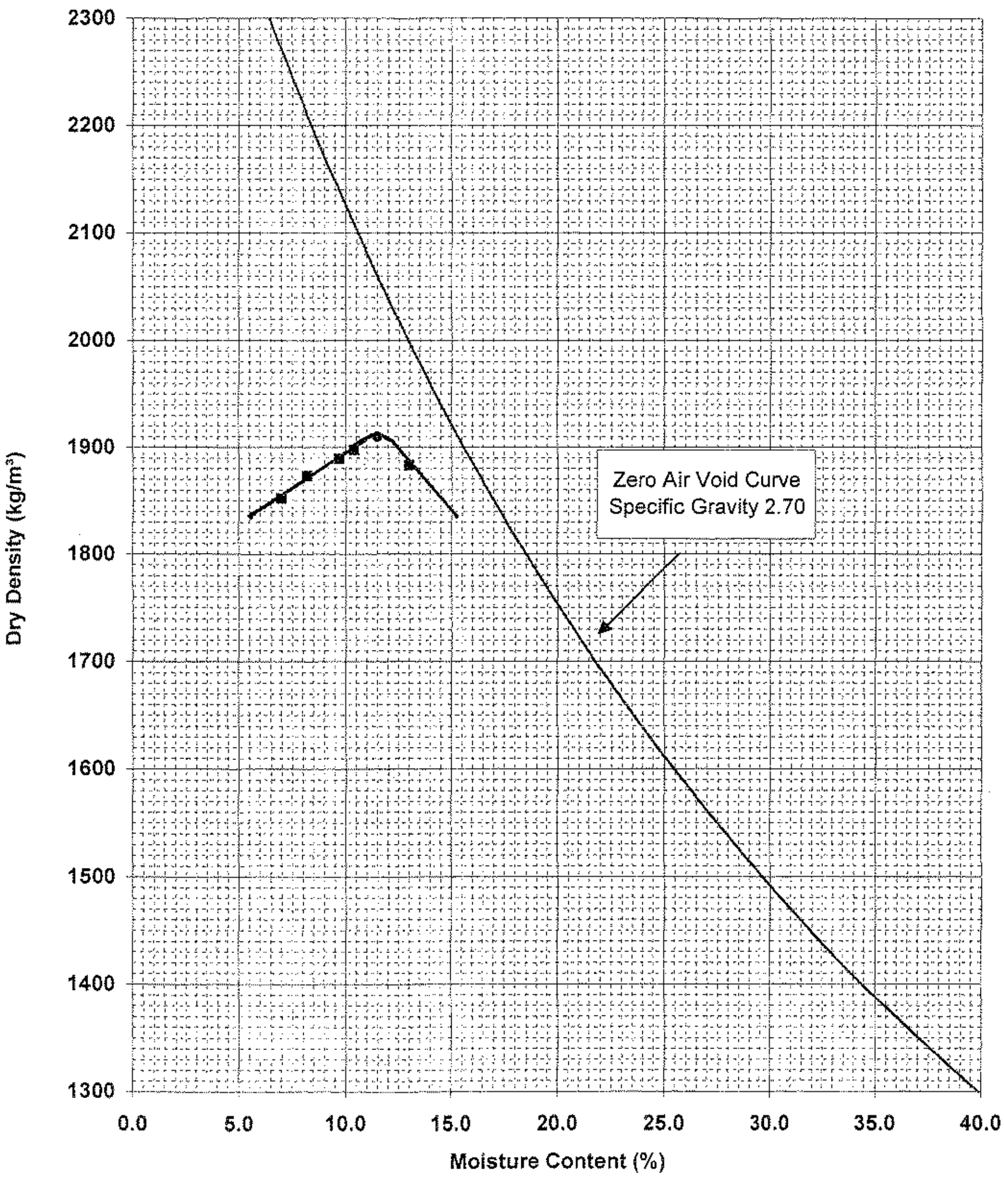
Project: Dam and Diversion Earthworks Monitoring Service - Jericho Project Site, NWT **Sample Number:** 739

Project No.: 0101-1100060.007 **Date Tested:** 06/02/13

Client: Tahera Diamond Corporation c/o Nuna Logistics **Moisture Content (as received):** N/A

Soil Description: SAND, gravelly (12.5mm max.), tr. silt - grey **Maximum Dry Density:** 1910 kg/m³

Sample Location: Coarse Pk #1 **Optimum Moisture Content:** 11.5%



STANDARD PROCTOR

ASTM D698

Hammer Mass: 2.494 kg

Hammer Drop: 304.8 mm

Number of Layers: 3

Number of Blows/Layer: 56

Diameter of Mould: 152.3 mm

Height of Mould: 116.5 mm

Mould Volume: 0.00212 m³

Compactive Effort: 590.3 kJ/m³

REVIEWED BY:

REMARKS:

eba

APPENDIX

APPENDIX D LIMITATIONS

GEOTECHNICAL REPORT – GENERAL CONDITIONS

This report incorporates and is subject to these "General Conditions".

1.0 USE OF REPORT AND OWNERSHIP

This geotechnical report pertains to a specific site, a specific development and a specific scope of work. It is not applicable to any other sites nor should it be relied upon for types of development other than that to which it refers. Any variation from the site or development would necessitate a supplementary geotechnical assessment.

This report and the recommendations contained in it are intended for the sole use of EBA's client. EBA does not accept any responsibility for the accuracy of any of the data, the analyses or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than EBA's client unless otherwise authorized in writing by EBA. Any unauthorized use of the report is at the sole risk of the user.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of EBA. Additional copies of the report, if required, may be obtained upon request.

2.0 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems and methods employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. EBA does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

3.0 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

4.0 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historic environment. EBA does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional investigation and review may be necessary.

5.0 SURFACE WATER AND GROUNDWATER CONDITIONS

Surface and groundwater conditions mentioned in this report are those observed at the times recorded in the report. These conditions vary with geological detail between observation sites; annual, seasonal and special meteorologic conditions; and with development activity. Interpretation of water conditions from observations and records is judgmental and constitutes an evaluation of circumstances as influenced by geology, meteorology and development activity. Deviations from these observations may occur during the course of development activities.

6.0 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

7.0 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

8.0 INFLUENCE OF CONSTRUCTION ACTIVITY

There is a direct correlation between construction activity and structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques are known.

9.0 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, as well as the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

10.0 DRAINAGE SYSTEMS

Where temporary or permanent drainage systems are installed within or around a structure, the systems which will be installed must protect the structure from loss of ground due to internal erosion and must be designed so as to assure continued performance of the drains. Specific design detail of such systems should be developed or reviewed by the geotechnical engineer. Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function.

11.0 BEARING CAPACITY

Design bearing capacities, loads and allowable stresses quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition assumed. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions assumed in this report in fact exist at the site.

12.0 SAMPLES

EBA will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the client's expense upon written request, otherwise samples will be discarded.

13.0 STANDARD OF CARE

Services performed by EBA for this report have been conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practising under similar conditions in the jurisdiction in which the services are provided. Engineering judgement has been applied in developing the conclusions and/or recommendations provided in this report. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of this report.

14.0 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, EBA has not been retained to investigate, address or consider and has not investigated, addressed or considered any environmental or regulatory issues associated with development on the subject site.

15.0 ALTERNATE REPORT FORMAT

Where EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed EBA's instruments of professional service), the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding. The hard copy versions submitted by EBA shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancies, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by EBA shall be deemed to be the overall original for the Project.

The Client agrees that both electronic file and hard copy versions of EBA's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EBA. The Client warrants that EBA's instruments of professional service will be used only and exactly as submitted by EBA.

The Client recognizes and agrees that electronic files submitted by EBA have been prepared and submitted using specific software and hardware systems. EBA makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.