MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

DESIGN OF THE TAILINGS STORAGE FACILITY
TO ULTIMATE ELEVATION
(REF. NO. VA101-001/08-1)

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EXECUTIVE SUMMARY

The Mount Polley gold and copper mine is owned by Mount Polley Mining Corporation (MPMC). The mine has been managing the facilities for care and maintenance activities since October 2001 and is scheduled to start up again in the first quarter of 2005. This report provides supporting documentation to allow for MPMC to permit on-going staged expansion of the TSF embankments to an ultimate elevation of 965.0m. This corresponds to storage for approximately 85 million tonnes of tailings. Detailed design reports, construction drawings and technical specifications will be required for each stage of the TSF expansions.

The staged expansion of the TSF involves modified centreline construction methods for the Main, Perimeter and South Embankments. This requires that fill materials be placed and compacted on the tailings beach. To achieve this the tailings should be evenly discharged from around the entire facility to establish competent beaches. The tailings pipeline will require an extension to the South Embankment to achieve an effective tailings deposition plan.

The TSF embankment drainage provisions include upstream toe drains for the Main, Perimeter and South Embankments. Multiple toe drains will be added for each embankment to incorporate suitable redundancy. The toe drains are effective in lowering the phreatic surface, which increases embankment stability and seepage control.

Stability analyses were completed for static and seismic conditions and indicate that the TSF embankments are stable under static conditions and that there will be no deformations initiated by earthquake loading.

The mine site is operating with a water surplus with the excess water being stored in the TSF. To accommodate the staged development of the TSF, MPMC is seeking an effluent permit to discharge tailings supernatant to the environment.

The instrumentation requirements will be reviewed as part of the annual inspection and each design phase. The two existing slope inclinometers at the toe of the Main Embankment will be extended during development of the shell zone. Three additional inclinometers will be installed following the Stage 4 raise.

Stage 4 drawings (crest El. 948.0 m) are included to allow for this stage to be permitted in advance if required.

The downstream shell zone will be constructed at its ultimate width. This will allow for the most efficient routing of haul trucks and also facilitates concurrent reclamation of the downstream slopes of the TSF embankments. The buttress at the Main Embankment is required for closure and can be constructed during any stage of the TSF expansion to accommodate the availability of shell zone material.

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SECTION 1.0 - INTRODUCTION

1.1 PROJECT DESCRIPTION

The Mount Polley gold and copper mine is owned by Mount Polley Mining Corporation (MPMC). It is located 56 kilometres northeast of Williams Lake, in central British Columbia. The project site is accessible by paved road from Williams Lake to Morehead Lake and then by gravel road for the final 12 km. The location of Mount Polley Mine is shown on Figure 1.1. Mount Polley Mine started production in 1997 and had milled approximately 27.5 million tonnes of ore prior to stopping production in October 2001. The mine has been managing the facilities for care and maintenance activities since then. The mine is scheduled to start up again in the first quarter of 2005. Consequently, MPMC is currently in the process of upgrading the mine facilities, which includes increasing the elevation of the Tailings Storage Facility Embankments to El. 945.0 m. This construction program (Stage 3C) is the final part of a tailings embankment raise previously permitted by the Ministry of Energy and Mines. An aerial photograph of Mount Polley Mine that was flown in the summer 2004 is shown on Figure 1.2.

1.2 SCOPE OF REPORT

The Mount Polley Mine consists of four pits: the Cariboo Pit, Bell Pit, Wight Pit, and the Springer Pit. The scope of this report is to provide supporting documentation to allow for MPMC to permit on-going staged expansion the Tailings Storage Facility (TSF) embankments to an ultimate elevation of 965.0m. This elevation will provide sufficient storage in the TSF for approximately 85 million tonnes of tailings while maintaining the required water storage and freeboard requirements. The scope of this report also provides supporting information for the Stage 4 expansion of the TSF, which is planned for the spring of 2005, and can be permitted separately so that any delays in the overall permitting process do not delay the required expansion of the TSF in the Spring of 2005.

The drawings contained within this report are for permitting support and are all “Not For Construction”. Detailed design reports, construction drawings and technical specifications must be prepared by a suitably qualified Professional Engineer for each stage of the TSF expansions, from Stage 4 through to the ultimate height of the facility.

1.3 REFERENCES

This report references the following documents which provide key supplementary information:

Hallam Knight Piésold Report "The Mount Polley Mine Project Reclamation Plan, Ref. No. H1221, April 1996."

MAJM Corporation Ltd., Report to Imperial Metals Corporation, "Geotechnical Review, Drainage Aspects Main Embankment Dam, Tailings Storage Facility Report," March 1997.

Mount Polley Mining Corporation, Mount Polley Mine, "Report on Stage Ia/Ib Construction", Ref. No. 10162/7-5, August 14, 1997.

Mount Polley Mining Corporation, Mount Polley Mine, Tailings Storage Facility, "Report on 2004 Annual Inspection", Ref. No. VA101-01/7-1, February 28, 2005.

Mount Polley Mining Corporation, Mount Polley Mine, Tailings Storage Facility "Report on 1995 Geotechnical Investigations for Mill Site and Tailings Storage Facility" (Knight Piésold Ref. No. 1623/1).

Mount Polley Mining Corporation, Mount Polley Mine, Tailings Storage Facility "Evaluation of Cycloned Tailings for Embankment Construction", Ref. No. 11162/11-1, June 16, 1999.

Mount Polley Mining Corporation, Mount Polley Mine, Tailings Storage Facility, "Updated Design Report", Ref. No. 1627/2, June 6, 1997.

Knight Piésold Ltd., "Modified Centreline Construction of Tailings Embankments", J.P. Haile and K. J. Brouwer.

Mount Polley Mining Corporation, Mount Polley Project, "Polley Lake Pumping System", Ref. No. 1628/5, February 19, 1997.

SECTION 2.0 - TAILINGS STORAGE FACILITY DESIGN

2.1 TAILINGS STORAGE FACILITY DESIGN

2.1.1 General

The principal objectives of the TSF are to provide secure containment for tailings solids and to ensure that the regional groundwater and surface water flows are not adversely affected during or after mining operations. The design and operation of the TSF is integrated with the overall water management objectives for the entire mine development, in that surface runoff from disturbed catchment areas is controlled, collected and contained on site. An additional requirement for the TSF is to allow effective reclamation of the tailings impoundment and associated disturbed areas at closure to meet land use objectives.

The main components of the TSF are as follows:

- The TSF embankments incorporate the following zones and materials:
  - Zone S - Core zone - fine grained glacial till.
  - Zone CS - Upstream shell - cycloned or spigotted tailings sand.
  - Zone B - Embankment shell zones - fine grained glacial till.
  - Zone F - Filter, drainage zones, and chimney drain - processed gravel and sand.
  - Zone T - Transition filter zone - select well-graded fine-grained rockfill.
  - Zone C - Downstream shell zone – rockfill.
  - Zone U – Upstream shell zone – parameters vary depending on material availability.
- A low permeability basin liner (natural and constructed), which covers the base of the entire facility, at a nominal depth of at least 2 m. The low permeability basin liner has proven to be effective in minimizing seepage from the TSF as there have been no indications of adverse water quality reporting to the groundwater monitoring wells.
- A foundation drain and pressure relief well system, located downstream of the Stage 1B Main Embankment. The foundation drain and pressure relief well system prevent the build-up of excess pore pressure in the foundation, and transfer groundwater and/or seepage to the collection ponds.
- Seepage collection ponds located downstream of the Main and Perimeter Embankments. These ponds were excavated in low permeability soils and store water collected from the embankment drains and from local runoff.
- Instrumentation in the tailings, earthfill embankments and embankment foundations. This includes vibrating wire piezometers, survey monuments, and slope inclinometers.
- A system of groundwater quality monitoring wells installed around the TSF.

The TSF has been designed to contain approximately 85 million tonnes of tailings solids at an average dry density of 1.36 tonnes/m^3. It may be possible to expand the TSF should the ore reserves at the mine increase above 85 million tonnes. Embankment raises above the proposed final crest elevation of El. 965 metres would likely be constructed by incorporating a downstream extension of the shell zone material to ensure that the stability requirements of the TSF embankments is maintained.

The classification of the TSF has been assessed using the Canadian Dam Association and the British Columbia Dam Safety Regulation guidelines. These guidelines look at the consequences of failure and consider life safety, economic and social losses, and environmental and cultural losses. The life safety category looks at the potential for multiple loss of life and considers the degree of development within the inundation area. The economic and social loss category considers damage to infrastructure, public and commercial facilities that are in and beyond the inundation area. This includes damage to railways, highways, powerlines, residences etc. The environmental and cultural loss considers damage to fish habitat at the regional, provincial, and national level, wildlife habitat, including water quality, and unique landscapes or sites of cultural significance.

The assessment indicates that the TSF has a "HIGH" hazard classification (or consequence category) based on the economic and social loss category. The classification for the life safety and environmental and cultural loss categories is "LOW", as there is low potential for multiple loss of life, the inundation area is typically undeveloped, and there is unlikely to be loss or significant deterioration of provincially or nationally important fish habitat. However, the TSF embankments will be up to 55 m high, and the estimated costs associated with repairing the damage, loss of service to the mine, and the potential economic impact on Imperial Metals, could exceed $1,000,000, which places the TSF into the "HIGH" economic and social losses category under the British Columbia Dam Safety Regulation guidelines.

The classification of dams under the Canadian Dam Association and the British Columbia Dam Safety Regulation guidelines corresponds to consequences of failure and does not relate in any way to the likelihood of failure. The embankment has been designed to accommodate a maximum design earthquake (MDE) corresponding to 50% of the maximum credible earthquake (MCE) and the impoundment is sized to contain the probable maximum precipitation (PMP) storm event. The TSF at Mount Polley Mine is visually inspected daily by MPMC staff during operations, and the embankment instrumentation is monitored at regular intervals during operations with the frequency of monitoring increasing during the TSF expansion phases. The likelihood of dam failure is therefore extremely low.

2.1.2 Foundation Conditions

The tailings basin is generally blanketed by naturally occurring well graded low permeability glacial till which functions as an in-situ soil liner and precludes seepage loss from the facility. However, a basin liner was constructed just upstream of the Main

Embankment to ensure that the basin liner had a minimum thickness of 2 metres throughout the tailings basin. The constructed basin liner was tied into the Main Embankment core zone and the existing basin liner where the in-situ thickness exceeded 2 m.

The foundation conditions at the Main Embankment consist of low permeability glacial till material at surface underlain by fluvial and lacustrine silts up to 20 m thick. The foundation conditions at the Perimeter Embankment consist of low permeability glacial till throughout that is generally in excess of 5 m. The foundation conditions at the South Embankment consist of a relatively thin, low permeability glacial till material overlying bedrock. The glacial till is a few metres thick but its thickness is not consistent throughout the South Embankment foundation. It is important not to expose the fractured bedrock and to ensure that the glacial till cover is at least 2 m thick throughout the foundation and that it is tied into the core zone. Details of the site geological investigations can be found in the Knight Piésold Report “Updated Design Report”, Ref. No. 1627/2, June 6, 1997. The geological investigation and sections from the Updated Design Report are included in Appendix G.

Laboratory testwork on the foundation soils indicates that the materials have adequate shear strength to ensure foundation stability of the embankments. Artesian pressures exist at the base of the Main Embankment. Pressure relief wells trenches have been installed at this location to depressurize the underlying glaciofluvial deposits.

2.1.3 Tailings Storage Facility Design

The Tailings Storage Embankments will be constructed to an ultimate crest elevation of 965.0 m. The Embankments are zoned earthfill structures with low permeability glacial till core zones, chimney drains, upstream drains and downstream rockfill zones. The design basis and operating criteria for the feasibility design of the TSF are presented on Table 2.1.

The tailings embankments have been designed for staged expansion during operations in order to minimize initial capital expenditures and to maintain an inherent flexibility to allow for variations in operation and production throughout the life of the mine. The Embankments are progressively raised using the modified centreline construction method. Further expansion of all of the embankments will involve till caps for the 2005 construction program followed by modified centreline raises for each year thereafter. A technical paper on the “Modified Centreline Construction of Tailings Embankments” is included in Appendix E. Future embankment raises allow for selected fill to be placed on tailings beaches. Consequently, a coarse bearing layer will be required on the tailings beach to establish a competent foundation. The on-going embankment raises will be re-evaluated during Annual Inspections carried out by the Design Engineer and as part of each expansion phase. The re-evaluation process will consider the performance of the embankments and the drainage systems, instrumentation records, mine throughput, storage capacity and freeboard requirements, and fill material availability.

The depth/area/capacity (DAC) curve has been updated using the updated topography from the 2004 flyover and the bathymetric survey of the tailings facility. The updated DAC curve is shown on Figure 2.1. The filling schedule and anticipated staged construction sequence of the TSF is shown on Figure 2.2. Each embankment raise will provide incremental storage capacity for approximately one year of production. The filling schedule incorporates sufficient live storage capacity for containment of runoff from the 24-hour PMP volume of 679,000 m^3 at all times, which would result in an incremental rise in the tailings pond level of approximately 0.39 m, with an additional allowance of 1 meter of freeboard for wave run-up.

The overall Mount Polley Mine site plan is shown on Drawing 100. The general arrangement of the TSF is shown on Drawing 102. The material specifications are shown on Drawing 104. The ultimate Main Embankment Plan and Sections and Details are shown on Drawings 110 and 115 respectively. The ultimate Perimeter Embankment Plan and Sections and Details are shown on Drawings 120 and 125 respectively. The ultimate South Embankment Plan and Sections and Details are shown on Drawings 130 and 135 respectively. Longitudinal and foundation drain details for the South Embankment are shown on Drawing 140. The crest details will be revised to suit the final reclamation objectives and will likely include a suitable wearing course, topsoil cover and vegetation. The ultimate embankment heights for the Main, Perimeter and South Embankments will be 55 m, 35 m, and 20 m respectively. The downstream slope of the ultimate Main Embankment will incorporate a buttress to increase the stability of the embankment to satisfy the factor of safety requirements at closure.

The design of the TSF to El. 965.0 m assumes that the tailings beaches are adjacent to the embankments. This can be achieved by implementing a tailings deposition plan which involves discharging tailings around the entire facility. The tailings beaches also enhance the stability of the embankments. The tailings beach development from Stage 5 though 10 is shown schematically on Figure 2.3. The pond is shown to be adjacent to the South Embankment for Stage 10 as the closure plan involves placing a spillway at this location.

The design of the TSF to El. 965.0 m is similar to the original design of the TSF. Changes to the design include the following:

- A buttress is required on the downstream slope of the Main Embankment to provide the required stability at closure.
- The South Embankment has been adjusted to allow for on-going expansion by the modified centreline method. The expansion of the Main and Perimeter Embankments will continue to be constructed by the modified centreline technique as per the original design.
- Slope inclinometers have been included at the toe of the Main Embankment to measure any potential deformation of the embankment and/or foundation materials.
- Upstream toe drains have been added to the South Embankment.

- The tailings pipeline will be extended to the South Embankment to facilitate tailings deposition and beach development.

2.1.4 Tailings and Reclaim Pipelines

The tailings pipeline comprises 7000 m of HDPE pipe of varying diameters and pressure ratings. It has a design flow of 20,000 tonnes/day at 35% solids by weight at the mill. Currently (early 2005), the tailings pipeline extends from the mill to the southern end of the facility along the Main Embankment, where a point discharge is used to discharge the tailings. The tailings pipeline previously installed along the crest of the Perimeter and Main Embankments was provided with a single relocateable discharge section, approximately 100 m long with flanges at either end, which included six, 150 mm offtakes. The line terminated with a 90-degree elbow, directed into the facility. Wherever it was installed, the movable discharge section allowed controlled deposition of tailings from an isolated section of the embankment. Relocation of the single discharge section was a labour intensive and costly activity.

The most efficient use of the TSF is made when tailings can be evenly distributed from around the perimeter of the facility and when the discharge location can be easily and systematically relocated. A system will be incorporated by MPMC to accommodate this objective. The existing pipeline could be progressively retrofitted over several years to spread out the costs.

Evenly discharging the tailings from around the facility optimizes the development of tailings beaches and keeps the supernatant pond clear of the embankments, thereby increasing seepage paths and limiting seepage loss from the facility. Beached tailings, when left to drain and consolidate, form the competent foundation needed for the modified centreline construction of embankment raises.

The expansion of the TSF assumes that tailings will be distributed evenly throughout the facility to establish tailings beaches at the Perimeter, Main and South Embankments. This requires extending the tailings pipeline to the South Embankment, which will involve adding a new tailings pipeline on the west side of the facility. The expansion of the tailings pipeline to the South Embankment will likely occur during the Stage 5 construction program. The tailings pipeline for the TSF with the new extension of the tailings pipeline is shown on Drawing 311.

The reclaim pipeline system returns water from the TSF to the millsite for re-use in the process. The system comprises a pump barge, a reclaim pipeline and a reclaim booster pump station. The reclaim pipeline remained operational during the care and maintenance period and was utilized to pump excess water from the TSF to the Cariboo Pit. Apart from general monitoring, maintenance and overhaul and the installation of new works associated with on-going embankment raises, no major upgrades are currently envisaged for the existing reclaim system.

The tailings pipeline, reclaim system, and tailings deposition within the TSF will be reviewed annually as part of the annual inspection and as part of each design phase for the expansion of the TSF. A review of the design of the tailings and reclaim pipelines will also be required should there be a significant increase in the mill throughput and make-up water requirements. The tailings and reclaim pipelines are discussed in detail in Appendix A. Details of the tailings and reclaim pipelines are shown on Drawings 310, 311, 312, 313, and 315.

2.1.5 Embankment Drainage Provisions

Embankment drainage provisions have been incorporated into the design of the TSF to facilitate drainage of the tailings mass, dewater the foundation soils, and to control the phreatic surface within the embankments. The components of the drainage systems consist of foundation drains, chimney drains, longitudinal drains, outlet drains, and upstream toe drains. The conveyance pipework for all of the drains terminates in the drain monitoring sumps at the Main and Perimeter Embankments where the drain flows and water quality are monitored. The embankment drainage systems will be extended during on-going embankment expansions as required. The drainage systems will be reviewed as part of the annual inspection and as part of each design phase for the expansion of the TSF. The drainage provisions for the TSF are as follows:

Foundation Drains - A system of foundation drains was installed in the Main and Perimeter Embankment foundations to improve the foundation conditions and enhance the dewatering of near surface soils. Pressure relief wells and pressure relief trenches connected to the foundation drains were included to depressurize the underlying glaciofluvial deposits to enhance the stability of the embankment.

Chimney, Longitudinal and Outlet Drains - A Chimney drain has been included in the Main and Perimeter Embankments and is planned for the South Embankment. The chimney drains provide a contingency drainage measure for control of the phreatic surface in the embankment and will also function as a crack stopper downstream of the core zone. Water collected in the chimney drains is routed to the drain monitoring sumps via the longitudinal and outlet drains.

Upstream Toe Drains - Upstream toe drains have been installed in the Main Embankment and will be included in the Perimeter and South Embankments during the staged expansions of the TSF. The locations and elevations of the upstream toe drains will be reviewed during the design phase of the staged expansions. The purpose of the upstream toe drains is to drain and consolidate the tailings mass near the embankments. Piezometer records at the Main Embankment indicate that the upstream toe drain is effective in draining the sandy tailings adjacent to the embankment. The upstream toe drains also remove a certain amount of filtered water from the impoundment, and it may be possible to establish water discharge points below the seepage collection ponds if water quality objectives are met. The installation of the upstream toe drains was recommended during an independent third party review conducted by Fred Matich of

MATM in 1997 in a "Geotechnical Review, Drainage Aspects" for the Main Embankment. The location of the toe drains will be in competent foundation materials. An allowance has also been made for installing toe drains at different elevations should monitoring records indicate their requirement. Details of the upstream toe drain are shown on Drawing 255.

2.1.6 Seepage Collection Ponds

The Main Embankment Seepage Collection Pond, located immediately downstream of the Main Embankment, was completed at the start of the Stage 1a construction program in 1997. The Perimeter Embankment Seepage Collection Pond was excavated during Stage 1b construction in 1997. These ponds were excavated in low permeability glacial till materials. The South Embankment currently does not have a seepage collection pond. An assessment on the requirement for the South Embankment seepage collection pond will be undertaken as part of the annual construction/annual inspection reports. However, the South Embankment will require at least a sump for the foundation, upstream toe, and filter drains.

The seepage collection ponds collect water from the embankment drain systems and from local runoff. Water from the Seepage Collection Ponds is of good quality and MPMC were permitted to discharge water during the care and maintenance period. Recently, the Ministry of Water, Lands, and Air Protection authorized discharge from the Main Embankment Seepage Collection pond. MPMC are actively monitoring water quality and discharge rates (during the care and maintenance period) and regularly report this information to the relevant regulatory authorities. MPMC is also developing Site Specific Water Quality Objectives, and are investigating options to release larger volumes of water from the overall site to reduce or prevent the accumulation of excess supernatant water in the TSF.

2.2 SEEPAGE AND STABILITY ANALYSES

2.2.1 Seepage Analyses

Seepage analyses were completed using SEEP/W to delineate the phreatic surface and pore pressures within the tailings mass and the embankment fill materials. The seepage analyses were also used to estimate seepage from the TSF drainage systems during operations and post-closure. The previous design for the TSF incorporated upstream toe drains for the Main and Perimeter Embankments to reduce pore pressures, minimize seepage losses and to enhance the stability of the modified centerline embankments. The seepage analyses will establish the requirement for toe drains within the South Embankment and the configuration of upstream toe drains within the Main and Perimeter Embankments. The seepage analyses are also used to estimate the seepage from the embankment drainage systems to the seepage collection ponds and also to estimate the unrecoverable seepage from the TSF. The results of the seepage analyses have also been used to provide appropriate pore pressure parameters for use in the stability analyses.

The seepage analyses were performed with the TSF embankments at an elevation of 965.0 m. Piezometer records were used to calibrate the initial phreatic surface used in the analyses. A typical embankment section and material parameters used in the seepage analyses are included in Appendix B.

The seepage analyses indicate that upstream toe drains are effective in reducing the phreatic surface and pore pressures in the TSF embankment fill materials. The inclusion of upstream toe drains also provides seepage control within the embankment and reduces the likelihood of piping. The seepage analyses were also completed without upstream toe drains to determine the phreatic surface, seepage, and pore pressures in the event that the drains are deliberately plugged or cease to operate in the long term. The estimated seepage from the ultimate TSF is summarised on Table 2.2. The upstream toe drain intercepts the majority of the seepage through the embankment. The upstream toe drains allow for effective seepage control as the flows from these drains can be isolated and potentially discharged should the water quality be acceptable. Experience at the site has shown that the quality of water flowing from the toe drains is better than supernatant water quality for most parameters, largely because the suspended solids are effectively filtered before the water enters the drains.

2.2.2 Stability Analysis

Stability analyses for each embankment were performed using the limit equilibrium computer program SLOPE/W. Static and seismic stability analyses were conducted to investigate the stability of the Main, Perimeter, and South Embankments during operations and post closure. Material parameters adopted for the tailings, foundation and earth embankment materials were based on testwork from the 1995 and 1997 geotechnical investigations, from the various quality control records obtained during construction of previous stages, and from experience with typical values for similar materials. The minimum acceptable factor of safety under static conditions is 1.3 during operations and 1.5 for closure. The stability analyses of the Main Embankment modelled the artesian pressures encountered in this area. The stability analyses were also completed to model upstream slip surfaces resulting from a partially consolidated upstream tailings mass. The upstream stability analyses conservatively modeled a high phreatic surface corresponding to a plugged toe drain.

Details of the SLOPE/W analyses including material parameters and typical embankment sections are included in Appendix C. The site seismic conditions and ground acceleration factors for the OBE and MDE are also included in Appendix C.

The results of the SLOPE/W stability analyses indicate that TSF embankments are stable during operations with and without upstream toe drains. However, a buttress is required at the Main Embankment to increase the factor of safety at closure to the required 1.5.

The factor of safety for the TSF embankments for static conditions with upstream toe drains ranged from 1.7 to 2.0. The factor of safety for the TSF embankments for static conditions without upstream toe drains ranged from 1.5 to 1.8. The factor of safety for the upstream stability analyses under static conditions was 4.1. The results of the static stability analyses indicate that the static factors of safety exceed the minimum requirements during operations and for closure.

The seismic analyses were completed using ground accelerations of 0.037g for the OBE and 0.065g for the MDE. The factor of safety for the TSF embankments for seismic conditions with upstream toe drains ranged from 1.5 to 1.8 for the OBE and 1.4 to 1.7 for the MDE. The factor of safety for the TSF embankments for seismic conditions without upstream toe drains ranged from 1.4 to 1.7 for the OBE and 1.3 to 1.6 for the MDE. The factor of safety for the upstream stability analyses under seismic conditions was 3.7 for the OBE and 2.7 for the MDE. These seismic stability results imply that the embankments are stable for seismic conditions and that there will be no deformations initiated by earthquake loading.

A post liquefaction study was completed to provide a conservative assessment of the stability of the TSF embankments assuming the tailings material liquefies and has a very low residual strength. The factor of safety for the TSF embankments for post liquefaction conditions with upstream toe drains ranged from 1.6 to 1.9. The factor of safety for the TSF embankments for post liquefaction conditions without upstream toe drains ranged from 1.5 to 1.8. The factor of safety for the upstream stability analyses under post liquefaction conditions was 2.0.

The results of the stability analyses are summarised on Table 2.3. The results of the stability analyses indicate that the TSF embankments are stable under static, seismic, and post liquefaction conditions and that the embankments do not rely on the tailings mass for stability.

The stability of the ultimate Main Embankment was studied further using the finite difference modelling program FLAC/Slope (Version 4.0, Itasca Consulting Group Inc., 2002). Numerical analyses were performed to determine the factor of safety against failure and to define the critical failure surface which may be different from those that can be modelled using limit equilibrium methods. The factors-of-safety against failure were determined for the following scenarios:

- Long-term static stability;
- Static Post-liquefaction (flow-slide) stability.

The model geometry, groundwater conditions and material parameters used in FLAC/Slope were the same as the conditions modelled in SLOPE/W.

Results from the finite difference analyses indicate that acceptable factors of safety will be maintained for the ultimate Main Embankment for long-term static stability and post-liquefaction stability.

The estimated factor of safety for long term static stability of the ultimate Main Embankment is 1.5. The factor of safety value is considered to be an acceptable value and agrees well with similar SLOPE/W limit equilibrium analyses.

The static post-liquefaction analysis was used to estimate the factor of safety against a flow slide failure following a MDE event. The factor of safety for post-liquefaction conditions was determined to be approximately 1.3.

Results of the analyses are plotted on Figure C-8 and C-9 in Appendix C. The figures show the maximum shear strain rates through the Main Embankment, which delineate the potential failure surfaces. The velocity vectors plotted on the figures have been magnified to illustrate the relative movement of the failure surface. The potential failure for the long-term static analysis is estimated to be a composite failure with a rotational-type failure near the embankment crest which develops into a translational/slide failure at the toe through the weaker foundation till. The potential failure for the post-liquefaction static analysis is estimated to be a translational/slide failure along the weaker foundation till. The factors of safety against these critical failure modes are adequate.

2.3 WATER MANAGEMENT PLAN

A site water balance was created in July 2004 to aid in water management planning and to estimate water surplus or deficit volumes in the TSF following the resumption of operations. The results of the water balance, hydrometeorology conditions, and mine development plans were issued in a Letter to Imperial Metals Corporation on July 30, 2004 (KP. Ref. No. 4-0816). This letter, along with the water balance and supporting tables and figures, is included in Appendix D. The objectives of the water balance were to:

- Effectively manage the water to minimize the need for regulated discharges to surface water and prevent the need for water removal from Polley Lake.
- Capture and manage all water that has been affected by mine components.
- Divert runoff from undisturbed areas away from the mine site and tailings facility (TSF).
- Store some excess TSF water to be used to accelerate pit filling at closure.
- Drain the TSF at closure by routing the water into the open pits.

The site water balance has been updated to account for a March 2005 start-up date and projected throughput values received from MPMC. The updated water balance was completed for average precipitation conditions for the mine. The results of the water balance indicate that the mine site is currently moving from a deficit to a surplus condition and the water must be stored on site to meet the current effluent permits. It is anticipated that the majority of this water will require storage in the TSF during operations, unless the effluent permit can be amended to discharge tailings supernatant. The updated water balance for years one to seven (with year one starting in 2005) is included in Appendix D. The water balance for the TSF must be updated at least annually and must be reviewed by the Design Engineer.

2.4 MATERIAL QUANTITIES

Embankment fill quantities have been estimated for each stage of the TSF expansion up to an elevation of 965.0 m. Quantities are presented for the Zone C, Zone S, Zone B, Zone T, Zone F, Zone U, and CBL materials. The material quantities for the Main, Perimeter and South Embankments are shown on Tables 2.4 to 2.6 respectively. The total material quantities are shown on Table 2.7. The material quantity requirements versus elevation are shown on Figure 2.4. The fill quantities assume that the downstream shell zone will be constructed to the ultimate toe of the TSF during the Stage 5 expansion program, with the exception of the buttress at the Main Embankment which can be postponed to a later stage.

A study has been completed in conjunction with MPMC that compares the costs between hauling rock from the Wight Pit to the TSF versus blasting and hauling the material from the current rock borrow. The study was completed using both 785C and 777 haul trucks. The results indicate that hauling rock from the Wight Pit to the TSF is more economical, depending on the type of truck, than that associated with blasting and hauling the material from the current rock borrow. Use of rock for embankment construction also will reduce the size of the mine rock storage areas and will reduce the size of disturbance associated with expansion of the rock borrow quarry at the TSF.

2.5 INSTRUMENTATION

Piezometers

A total of 56 vibrating wire piezometers have been installed at the TSF to date. The piezometers are grouped into tailings, foundation, embankment fill and drain piezometers and have been installed along eight planes designated as Monitoring Planes A to H. An additional monitoring plane (Plane I) will be installed at the south Embankment. The piezometer locations are shown on Drawings 236, 238, 240, 242, and 244. The piezometers are read monthly during operations and weekly during TSF construction programs as per the OM&S Manual. The piezometer data is reviewed annually as part of the annual inspection. The piezometer records for the TSF have recently been reported in Knight Piésold Report “2004 Annual Inspection”, (Ref. No. VA101-1/7-1, February 8, 2005).

Additional foundation, embankment fill and drain piezometers will be installed during the expansion of the TSF Embankments. The additional piezometers will be installed at the existing monitoring planes with an additional plane being located at the South Embankment. Approximately 81 new piezometers will be installed during the expansion phases of the TSF. The proposed locations of the new piezometers are shown on Drawings 246, 247, 248 and 249.

Inclinometers

Two slope inclinometers were installed in July 2001 at the toe of the Main Embankment through the lacustrine silts to measure potential deformation of the embankment materials. There has been no significant deviation in the inclinometers since they were installed in 2001. The inclinometers will be extended as required prior to expansion of the Main Embankment. Regular monitoring should be undertaken in order to utilize this installation fully. Monitoring with the inclinometer probe will be undertaken on an annual basis (twice a month during construction programs).

The existing inclinometers will need to be carefully extended through the shell zone material as it is raised. This can be achieved by placing and compacting granular fill around the inclinometers prior to raising the shell zone. The extension of the inclinometers is shown on Drawing 250. Three additional inclinometers will be installed at the Main Embankment during the Stage 4 expansion. The proposed location of the three additional inclinometers is shown on Drawing 210.

Survey Monuments

Survey monuments will be installed on the TSF Embankment crests as part of each expansion of the TSF. The proposed location of the survey monuments is shown on Drawings 246 to 249 for the Main, Perimeter, and South Embankments respectively. The survey monuments will be monitored on a quarterly basis as per the OM&S Manual.

SECTION 3.0 - STAGE 4 EXPANSION

The Stage 4 expansion of the Tailings Storage Facility will consist of placing an upstream cap on the embankments to an elevation of 948.0 m. This corresponds to an increase in the crest elevation above the Stage 3C construction program of 3 m and will provide storage for tailings and water for approximately 1 year of operation. The Stage 4 expansion requires placing a coarse bearing layer of sandy gravel or rockfill on the tailings surface to provide a suitable bearing layer for the placement and compaction of the fill material. It is imperative that the tailings deposition within the TSF be managed appropriately to ensure that the pond is kept away from the embankments to ensure that there is a competent foundation for the coarse bearing layer. The Stage 4 cap will consist of a Zone S core with a coarse aggregate material (Zone U) to be placed upstream of the core on the coarse bearing layer. Instrumentation requirements for the Stage 4 expansion will consist of placing survey monuments on the 948.0 m crest once completed.

Additional work to be completed during the Stage 4 expansion includes the following:

- Install foundation drains at the South Embankment prior to placement of downstream shell zone material.
- Install sump and seepage recycle pumpback system at the South Embankment.
- Extend the slope inclinometers at the Main Embankment concurrently with the downstream shell zone.
- Extend the piezometer cables to readout boxes located beyond the ultimate toe of the embankments.
- Extend the toe drains to the seepage recycle sumps and ponds as required.
- Extend the existing buttress at the Main Embankment to the ultimate toe and install three additional inclinometers.
- Maintain or re-instate seepage recycle pipelines at the Main Embankment Seepage Recycle Pond.

The Stage 4 Main Embankment Plan and Sections and Details are shown on Drawings 210 and 215 respectively. The Stage 4 Perimeter Embankment Plan and Sections and Details are shown on Drawings 220 and 225 respectively. The Stage 4 South Embankment Plan and Sections and Details are shown on Drawings 230 and 235 respectively. The Stage 4 detailed design drawings and technical specifications will be issued as part of the Stage 4 expansion. Typical technical specifications from Stage 3C are included in Appendix F.

The Stage 5 expansion will be competed in 2006 and will require increasing the downstream shell zone to the full height of the Stage 5 expansion, with the exception of the buttress at the Main Embankment. The shell zone will also extend to the ultimate downstream toe of the TSF. The material to be used to expand the downstream shell Zone will likely be waste rock from the development of the Wight Pit. The haulage and placement of this material can be done at any time prior to the Stage 5 expansion of the core and filter zones and will be completed by MPMC with mine equipment.

SECTION 4.0 - CLOSURE AND RECLAMATION

In accordance with requirements under the B.C. Mines Act and Health, Safety and Reclamation Code for Mines in British Columbia, the primary objective of the proposed Reclamation Plan will be to "return all mine-disturbed areas to an equivalent level of capability to that which existed prior to mining on an average property basis, unless the owner, agent or manager can provide evidence which demonstrates to the satisfaction of the chief inspector the impracticality of doing so." The following goals are implicit in achieving this primary objective for the Tailings Storage Facility:

- Long-term preservation of water quality within and downstream of decommissioned operations.
- Long-term stability of the tailings impoundment.
- Removal of all access roads, ponds, ditches, pipelines, structures and equipment not required after the mine closes.
- Long-term stabilization of all exposed materials that are susceptible to erosion.
- Natural integration of disturbed lands into surrounding landscape, and restoration of the natural appearance of the area after mining ceases, to the greatest possible extent.
- Establishment of a self-sustaining vegetative cover consistent with existing forestry, grazing, wildlife and outdoor recreation needs.

As an overall approach to achieving these objectives, the Reclamation Plan is sufficiently flexible to allow for future changes in the mine plan and to incorporate information obtained from ongoing reclamation research programs such as trial tailings re-vegetation plots.

The detailed Reclamation Plan for the Mount Polley Mine is presented in the Hallam Knight Piésold document "The Mount Polley Mine Project Reclamation Plan", Ref. No. H1221, April 1996.

The general concept is that the surface of the tailings impoundment will be decommissioned as a mixed forested/wetlands complex with a gradual transition towards a ponded area with an overflow spillway. The downstream face of the tailings embankments will be covered with selected overburden materials and revegetated progressively during operations to the greatest extent possible, once the final toe position and slope have been established.

At mine closure, surface facilities will be removed in stages, salvaged and sold. The tailings conveyance system will be dismantled and removed immediately following cessation of operations. The reclaim barge, pumps and pipeline will be utilized for supplementary flooding of the open pits and will then be dismantled and removed. The seepage collection ponds and recycle pumps will be retained for a period after closure until monitoring results indicate that tailings area seepage is of suitable quality for direct release to the environment. At that time, the seepage collection pond and recycle pumps will be removed. The groundwater monitoring wells and piezometers in the tailings embankment will be retained for long term monitoring.

The TSF will be re-vegetated to accommodate the end land use objective of forested land with a shallow marsh.

A spillway will be constructed to accommodate the Probable Maximum Flood (PMF) flows within the tailings basin. The spillway will be constructed in competent ground along the abutment of an Embankment and will discharge to the receiving environment. The elevation of this spillway and outflow channel will be designed to establish a set water elevation over the tailings surface (approximately 15% coverage).

Final seeding of the embankment slopes with grasses and legumes will provide a stable vegetation mat that resists erosion. Once the open pit flooding is complete, the surface water diversion system will be dismantled to allow for natural runoff to be routed through the tailings area.

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SECTION 5.0 - CERTIFICATION

This report was prepared and approved by the undersigned.

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
L.J. GALBRAITH
25493
March 15/05

Prepared by:

Les Galbraith, P.Eng.
Senior Engineer

Approved by:

Ken J. Brouwer, P.Eng.
Managing Director

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TABLE 2.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

DESIGN BASIS AND OPERATING CRITERIA

Print: 14-Mar-05
Rev'd: 11-Mar-05

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ITEM	DESIGN CRITERIA
1.0 GENERAL DESIGN CRITERIA	
Regulations	MEM, WLAP
Codes and Standards	ASTM, ACI, ANSI, CSA, CDSA, HSRC (Health, Safety and Reclamation Code for Mines in BC), NBC and related codes
Design Operating Life	10 Years
Tailings Production Information	20,000 tonnes/day, 25% solids, 2.70 SG, 76 million tonnes total production, 1.36 tonnes/m^3 final average tailings dry density
Hazard Rating:	HIGH by CDA Consequence Classification / British Columbia Dam Safety Regulation of the Water Act
Site Elevation	910 to 1150 metres
Climate	Average Annual Rainfall = 740 mm, Annual Evaporation = 423 mm, Mean Annual Temp = 4.0 C (Likely), Design 24 hour PMP storm = 203 mm.
Design Earthquakes: OBE (operations) MDE (closure)	 1 in 475 Year Event (M = 6.5, A_{max}. = 0.037 g). 50% of the 1 in 2500 Year Event or MCE (M = 6.5, A_{max}. = 0.065 g).
Seepage Control	Low permeability glacial till liners (natural and constructed) in basin, with foundation drain system below main embankment. Foundation and chimney drain seepage is contained within the seepage collection ponds.
Tailings Pipework	Butt fusion welded HDPE pipe, gravity flow, discharge predominantly from embankment, spill containment by gravity flow to tailings basin.
2.0 TAILINGS BASIN	
Geological and Geotechnical Conditions	The TSF basin and foundation comprises glacial soils of variable permeability and strength.
Basin Liner	• In-situ low permeability glacial till, or • Constructed glacial till liner with frost protection layer. Required in areas with <2 m in-situ glacial till.
Embankment Foundation Drains	• Installed in Main and Perimeter Embankment foundations. Foundation drains to be installed at the South Embankment during the Stage 4 expansion. • Foundation drains discharge to the seepage collection ponds at the Main and Perimeter Embankments via drain monitoring sumps. The foundation drain at the South Embankment will discharge to a sump where the flows will be monitored and pumped back to the TSF.
Stripping	• Required at areas directly affected by construction (embankments, basin liners, seepage collection ponds, reclaim barge channel stockpiles, road, etc). • Remove organic soil to topsoil stockpiles

TABLE 2.1

MOUNT POLLEY MINING CORPORATION
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DESIGN BASIS AND OPERATING CRITERIA

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3.0 TAILINGS EMBANKMENT	
Function	• Storage of tailings and process water for design life • Provide storage for 24 hour PMP storm • Provision for routing PMF at closure
Embankment Crest Width	6 m (min). (main embankment) for Stage 3C. Final width 9m.
Embankment Height: Current Final	El. 944 m (March 2005) El. 965 m
Embankment Crest Length: Current Final	3450 m (March 2005) 4435 m
Design Tonnage	7,300,000 tpy (20,000) tpd
Solids Content of Tailings Stream	35% (before Millsite and waste dump runoff added to tailings stream)
Freeboard: Operations Closure	24 hour PMP event (679,000 m^3) plus 1.0m wave run. Sufficient to provide routing of PMF plus wave run-up.
Storage Capacity	85 million tonnes.
Tailings Density:	1.36 t/m^3
Tailings Specific Gravity	2.70
Emergency Spillway Flows: Operations Closure	Not required. Design flow for routing PMF event.
Filling Rate	Refer to Figure 2.2.
Fill Material / Compaction Requirements	Refer Drawing 101-1/8-104.
Sediment Control	Primary control provided by the TSF Embankments. Secondary control provided by the seepage collection ponds.
Seepage Control	Seepage collection ponds and pumpback well systems.
Spillway Discharge Capacity	Not required during operations.
Surface Erosion Protection	Re-vegetation with grasses on final embankment slope.
4.0 PIPEWORKS	
4.1 Tailings Pipeworks	
Function	Transport tailings slurry and mill site and waste dump runoff to TSF.
Tailings Pipeline	• Free draining, gravity flow pipeline. • Butt fusion welded HDPE with 24" / 30" DR15.5 and 22" DR17.
Spigots	• Movable discharge section placed on tailings embankment crest.
Flow Rate	• Design throughput 770 tonnes/hr dry solids. • Slurry solids content 25%. • Design flow 19.6 cfs (0.55m^3/s). Increases to 23.8 cfs (0.67m^3/s) at 30% solids content with addition of 4.2 cfs storm water runoff. Waste dump and Millsite runoff added to tailings stream, increasing flow and decreasing solids content.
Spill Containment: *Mill site to Bootjack Creek* *Bootjack Creek Crossing* *Bootjack Creek to TSF*	 • Pipeline laid in pipe containment channel. There is an overflow pond for the T2 Dropbox. • Pipeline sleeved in pipe containment channel. • Pipeline laid in pipe containment channel.

TABLE 2.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

DESIGN BASIS AND OPERATING CRITERIA

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4.2 Reclaim Water System	
Function	Primary source of water for milling process. (Pump and Barge System Designed by Others.)
Reclaim Barge	• Prefabricated pump station on barge in excavated channel in TSF. • Local and remote control from Millsite.
Reclaim Pipeline	• 24" pipeline with a steel section at the reclaim barge and HDPE with varying pressure ratings along length.
Reclaim Booster Pump Station	• Prefabricated pump station located between TSF and Millsite. • Identical pumps, sensors and controls as reclaim barge for ease of maintenance.
Spill Containment	• See Item 4.1 above. • Booster pump station has closed sump.
4.3 Seepage Recycle System	
Function	Return seepage and foundation drain flows to TSF.
Drain Monitoring Sumps	Flow quantity and water quality measurements on individual drains.
Seepage Collection Ponds	• Sized to hold 10 times maximum weekly seepage flow quantity. • Excavated in low permeability natural soils, operated as groundwater sink.
Seepage Recycle Pumps	• Set in vertical pump sumps. • Submersible pumps, system by Others. • Pumps discharge back to TSF via 150 mm HDPE pipes.
5.0 WATER MANAGEMENT	
5.1 General	To contain runoff from disturbed project areas when and as required to meet the project Water Management Plan objectives.
5.2 Millsite Sump	
Catchment Area	Approx. 20 ha direct catchment, plus pit dewatering.
Design Storm	1.5 x 1 in 10 yr. 24 hour event runoff (6,000 m^3)
Sump Cross-Section	3:1 inside slope, 2:1 outside slope, 4m crest width.
Normal Operating Level	1102.7 m
Maximum Operating Level	1106.2 m
Flow Control Structures	Reference Report 1627/2, Drawing No. 1625.232.
Discharge Pipe	300 mm HDPE DR 21 to plant or tailings line.
Flow Monitoring	None.
5.3 Southeast Sediment Pond	
Catchment Area	Approx. 150 ha direct catchment.
Design Storm	1 in 10 yr. 24 hour event runoff (25,000 m^3)
Sump Cross-Section	3:1 inside slope, 2:1 outside slope, 4m crest width.
Normal Operating Level	1054.5 m
Maximum Operating Level	1057.4 m
Flow Control Structures	Reference Report 1627/2, Drawing No. 1625.232.
Discharge Pipe	250 mm HDPE DR 21 to Reclaim sump or T2 Dropbox
Flow Monitoring	None.

TABLE 2.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

DESIGN BASIS AND OPERATING CRITERIA

5.4 Polley Lake Pump Station	Reference Report 1628/5. Used for supply of additional makeup water during initial years of operation. Dismantled and no longer required.
5.5 Caribou Pit	
	Pit used for disposal of excess tailings pond water during care and maintenance period.
INSTRUMENTATION AND MONITORING	
6.1 General	To quantify environmental conditions and performance characteristics of the TSF to ensure compliance with design objectives.
6.2 Geotechnical Instrumentation and Monitoring	
Piezometers	• Measure pore pressures in drains, foundations, fill materials and tailings. • Vibrating wire piezometers. • Installed by qualified technical personnel. • Four instrumentation planes for Main Embankment, three for the Perimeter Embankment, and two for the South Embankment. • 56 piezometers installed to date. Approximately 81 to be installed in future stages.
Survey Monuments	• Deformation and settlement monitoring of embankments.
Inclinometers	• Measure potential deformation of the embankment materials. • Installed by qualified technical personnel. • Two slope inclinometers installed at the toe of the Main Embankment. Three additional slope inclinometers to be installed downstream of the Main Embankment.
6.3 Flow Monitoring	• To provide data for on-going water balance calculations. • Drain flows regularly monitored. • Reclaim and seepage pump systems flow meters. • Tailings output monitored at millsite. • Stream flow monitoring.
6.4 Water Quality Monitoring	• To ensure environmental compliance. • Water quality samples taken at regular intervals from sediment ponds, drains (at drain monitor sump), groundwater monitoring wells, seepage ponds and tailings pond. • Upstream and downstream samples for impact analysis.
6.5 Hydrometeorology	• Site weather station for input to water balance calculations. • Site monitoring of precipitation (rain and snow), evaporation, air quality monitoring (dust, etc.).
6.6 Operational Monitoring	• Quantify operation of tailings storage facility. • Rate of tailings accumulation in terms of mass and volume. • Tailings characteristics and water recovery. • Supernatant pond (depth, area and volume).

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TABLE 2.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

DESIGN BASIS AND OPERATING CRITERIA

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CLOSURE REQUIREMENTS	
7.1 General	Return impoundment to equivalent pre-mining use and productivity by establishing a wetland area adjacent to a final spillway and re-vegetating remainder of tailings surface with indigenous species of trees, shrubs and grasses adjacent to embankment grading to aquatic species along and adjacent to final pond.
7.2 Spillway	Two stage spillway with lower channel outlet designed to pass 1 in 200 yr. 24 hour flood event and upper wider outlet section designed to pass PMF without overtopping embankments. Designed to consider protection against beaver dams.

Notes:
1. The closure plan will remain flexible during operations to allow for future changes in the mine plan and to incorporate information from on-going reclamation programs.

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TABLE 2.2

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

SEEPAGE ANALYSES SUMMARY

Rev'd 03/10/05
M:\1\01\00001\08\A\Report\Report 1\Tables\[Table 2.2.xls]Table 2.2 Rev 0 Printed 3/11/2005

Embankment Section	Condition	Total Seepage (L/s)	Seepage through Embankment (L/s)	Seepage Intercepted by Toe Drain (L/s)	Seepage Intercepted by Foundation and Chimney Drains (L/s)	Seepage Loss (L/s)
Main	Toe Drain	12.6	11.7	9.7	2.0	0.9
	No Toe Drain	3.2	2.2	-	2.2	1.0
Perimeter	Toe Drain	21.8	19.3	18.9	0.3	2.5
	No Toe Drain	3.8	0.7	-	0.7	3.1
South	Toe Drain	2.4	2.4	2.3	0.0	0.001
	No Toe Drain	0.1	0.1	-	0.1	0.010

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TABLE 2.3

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

STABILITY ANALYSES SUMMARY

Rev'd 03/10/05

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Ultimate Embankment Section			Minimum Factor of Safety
Static Stability			
Downstream	Main	With existing Toe Drain [2][3][4]	1.7
		Closed Toe Drain [3][4]	1.5
	Perimeter	With installation of Toe Drain	2.0
		Closed Toe Drain	1.9
	South	With installation of Toe Drain	2.0
		Without a Toe Drain	1.8
Upstream	[1]	Without a Toe Drain	4.1
Seismic Stability (OBE/ MDE)			
Downstream	Main	With existing Toe Drain [2][3]	1.5/ 1.4
		Closed Toe Drain [3]	1.4/ 1.3
	Perimeter	With installation of Toe Drain	1.8/ 1.7
		Closed Toe Drain	1.7/ 1.6
	South	With installation of Toe Drain	1.7/ 1.6
		Without a Toe Drain	1.6/ 1.5
Upstream	[1]	Without a Toe Drain	3.7/ 2.7
Post Liquefaction Stability			
Downstream	Main	With existing Toe Drain [2][3]	1.6
		Closed Toe Drain [3]	1.5
	Perimeter	With installation of Toe Drain	1.9
		Closed Toe Drain	1.8
	South	With installation of Toe Drain	1.8
		Without a Toe Drain	1.8
Upstream	[1]	Without a Toe Drain	2.0

Notes:

[1] Upstream configuration is the same for all three embankment sections.

[2] Toe drains have currently been installed in the Main Embankment only.

[3] Artesian conditions modeled for the Main Embankment based on recorded piezometric data.

[4] A buttress is included in the Main Embankment design.

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TABLE 2.4

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

MAIN EMBANKMENT MATERIAL QUANTITIES ESTIMATE

Rev'd 03/02/05

M:\1\01\00001\08\A\Report\Report 1\Tables\[Table 2.4 to 2.7.xls]Table 2.4 Rev 0

Printed 3/11/05

	Zone C (m^3)	Zone S (m^3)	Zone F (m^3)	Zone T (m^3)	Zone U (m^3)	Zone CBL (m^3)
Stage 4 (948m)	0	40,000	8,000	7,000	48,000	15,000
Stage 5 (950m)	890,000	20,000	4,000	3,000	21,000	4,000
Stage 6 (953m)	72,000	29,000	5,000	5,000	21,000	8,000
Stage 7 (955m)	39,000	20,000	4,000	3,000	21,000	5,000
Stage 8 (958m)	45,000	29,000	5,000	5,000	25,000	8,000
Stage 9 (961m)	30,000	29,000	5,000	5,000	36,000	7,000
Stage 10 (965m)	11,000	39,000	6,000	6,000	22,000	13,000
Buttress	288,000					
Total	**1,375,000**	**206,000**	**37,000**	**34,000**	**194,000**	**60,000**

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TABLE 2.5

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

PERIMETER EMBANKMENT MATERIAL QUANTITIES ESTIMATE

Rev'd 03/02/05

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	Zone C (m^3)	Zone S (m^3)	Zone F (m^3)	Zone T (m^3)	Zone U (m^3)	Zone CBL (m^3)
Stage 4 (948m)	0	40,000	27,000	25,000	74,000	21,000
Stage 5 (950m)	753,000	30,000	5,000	5,000	32,000	6,000
Stage 6 (953m)	109,000	46,000	7,000	7,000	33,000	12,000
Stage 7 (955m)	61,000	32,000	7,000	5,000	34,000	8,000
Stage 8 (958m)	72,000	48,000	7,000	7,000	41,000	12,000
Stage 9 (961m)	32,000	49,000	7,000	7,000	63,000	11,000
Stage 10 (965m)	31,000	68,000	10,000	10,000	38,000	22,000
Total	**1,058,000**	**313,000**	**70,000**	**66,000**	**315,000**	**92,000**

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TABLE 2.6

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

SOUTH EMBANKMENT MATERIAL QUANTITIES ESTIMATE

Rev'd 03/02/05

M:\1\01\00001\08\A\Report\Report 1\Tables\[Table 2.4 to 2.7.xls]Table 2.6 Rev 0 Printed 3/11/05

	Zone C (m^3)	Zone S (m^3)	Zone F (m^3)	Zone T (m^3)	Zone U (m^3)	Zone CBL (m^3)
Stage 4 (948m)	70,000	17,000	6,000	7,000	7,000	0
Stage 5 (950m)	40,000	15,000	2,000	2,000	15,000	4,000
Stage 6 (953m)	57,000	24,000	4,000	4,000	17,000	5,000
Stage 7 (955m)	33,000	17,000	4,000	3,000	17,000	4,000
Stage 8 (958m)	39,000	25,000	4,000	4,000	22,000	6,000
Stage 9 (961m)	27,000	26,000	4,000	4,000	20,000	6,000
Stage 10 (965m)	16,000	35,000	5,000	5,000	33,000	12,000
Total	**282,000**	**159,000**	**29,000**	**29,000**	**131,000**	**37,000**

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TABLE 2.7

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

EMBANKMENTS MATERIAL QUANTITIES ESTIMATE TOTAL

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	Zone C (m^3)	Zone S (m^3)	Zone F (m^3)	Zone T (m^3)	Zone U (m^3)	Zone CBL (m^3)
Stage 4 (948m)	70,000	97,000	40,000	38,000	128,000	36,000
Stage 5 (950m)	1,682,000	64,000	10,000	9,000	66,000	13,000
Stage 6 (953m)	237,000	98,000	14,000	14,000	70,000	23,000
Stage 7 (955m)	132,000	67,000	14,000	10,000	72,000	17,000
Stage 8 (958m)	155,000	102,000	15,000	15,000	87,000	25,000
Stage 9 (961m)	88,000	104,000	15,000	15,000	119,000	24,000
Stage 10 (965m)	57,000	141,000	20,000	20,000	92,000	45,000
Buttress	288,000					
Total	**2,709,000**	**673,000**	**128,000**	**121,000**	**634,000**	**183,000**

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TABLE D-1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

SITE WATER BALANCE - NO DISCHARGE
YEAR 5

ASSUMPTIONS:

Solids Content 35%
Tailings S.G. = 2.85
Water Content of Ore = 4%
Dry Density (t/m^3) = 1.4
Initial Volume (m^3) = 6,587,293
Minimum Desired Volume = 1,000,000
Minimum Fresh Water Makeup = 2.4%
Underdrainage Recovery - Back to TSF (m^3)= 0
Initial Volume Cariboo Pit (m^3)= 1,518,080
Intitial Volume Wight Pit = 985,218
Initial Volume Bell Pit (m^3)= 193,761
Groundwater Seepage Loss (m^3/month) = 5,840

Discharge from Seepage Pond (Yes/no) no

Runoff Coefficients:

	General	Freshet	Low Flow Period
Unprepared Basin=	0.35	1	
Tailings Beach =	0.9	0.9	
Open Pit Area=	0.5	0.5	
Undisturbed RDS Areas =	0.24	1	0
Millsite Area =	0.50	0.5	
East RDS -Disturbed =	0.60	1	0
Downstream Tailings Areas =	0.7	1	
North RDS - Disturbed =	0.6	1	
Northeast RDS - Disturbed =	0.6	1	0

Areas:

Open Pits
Bell Pit (Area A) = 17
Diversion Efficiency = 100%
Springer Pit (Area B) = 36
Diversion Efficiency = 0%
Wight Pit (Area C) = 17
Diversion Efficiency = 100%
Cariboo Pit Area (Area D1) = 31
Cariboo Pit acts as a water storage pond

Rock Disposal Sites (RDS)
East Rock Disposal Site (RDS) - Disturbed (Area E1) = 55
Diversion Efficiency = 0%
East RDS - Undisturbed (Area E2) = 89
Diversion Efficiency = 0%
North RDS - Disturbed (Area F1) = 14
Diversion Efficiency = 100%
North RDS - Undisturbed (Area F2) = 2
Diversion Efficiency = 100%
Northeast RDS -Disturbed Area (Area G1) = 0
Diversion Efficiency = 100%
Northeast RDS - Un-Disturbed Area (Area G2) = 0
Diversion Efficiency = 100%

Assume Reclaimed

Mill Site
Millsite Area (Area H) = 59
Diversion Efficiency = 0%

Tailing Storage Facility (TSF)
Total Tailings Facility Area = 235.0
Pond Area (Area I) = 140.0
Beach Area (Area J) = 56.0

Unprepared Area (Area K) = 39.0
Biosolids Stockpile (Area L) = 4
Diversion Efficiency = 0%
Downstream Seepage Pond and Area (Area M) = 13
Diversion Efficiency = 0%

Groundwater Pumping Rate to TSF:		% to TSF
Cariboo Pit Groundwater Infiltration (m^3/mo) =	0	0
(gpm) =	0	
Wight Pit Groundwater Infiltration (m3/mo) =	78,091	0%
(gpm) =	450	
Bell Pit Groundwater Infiltration (m3/mo) =	16,909	0%
(gpm) =	100	
Springer Pit Groundwater Infiltration (m3/mo) =	27,055	100%
(gpm) =	160	

Note:
Water that reports to Cariboo Pit is stored in place and does not enter the TSF.

Water Pumped to Other Pits from the TSF

To Wight Pit (m3/year) = 0
To Cariboo Pit (m3/year) = 0
To Bell Pit (m3/year) = 0

Water Pumped to the TSF from Cariboo Pit
To TSF (m3/year) = 0

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DESCRIPTION	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	ANNUAL
Daily Ore Throughput (tpd) =	18888	18888	18888	18888	18888	18888	18888	18888	18888	18888	18888	18888	
					2009								
Precipitation (mm/month)	64	64	64	38	30	40	55	111	80	91	47	57	740
% of Annual Precipitation	8.6%	8.7%	8.7%	5.1%	4.1%	5.4%	7.4%	15.0%	10.8%	12.2%	6.3%	7.7%	100%
Evaporation (mm/month)	0.0	0.0	0.0	0.0	0.0	0.0	47.0	112.0	107.0	92.0	50.0	15.0	423
Days per Month	30.0	31.0	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	365
<WATER INTO TAILINGS IMPOUNDMENT> (m^3)													
Open Pits													
Bell Pit (Area 7a)	0	0	0	0	0	0	0	0	0	0	0	0	0
Bell Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Springer Pit (Area 11)	11,506	0	0	0	8,387	22,108	21,834	20,017	14,413	16,308	8,391	10,235	133,200
Springer Pit Groundwater	26,182	27,055	27,055	24,438	27,055	26,182	27,055	26,182	27,055	27,055	26,182	27,055	318,545
Wight Pit (Area 12)	0	0	0	0	0	0	0	0	0	0	0	0	0
Wight Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Rock Disposal Sites (RDS)													
East RDS - Disturbed (Area 5a)	21,094	0	0	0	25,628	87,554	66,716	0	0	0	0	0	180,992
East RDS - Undisturbed (Area 5b)	13,654	0	0	0	41,471	109,314	107,959	0	0	0	0	0	272,398
North RDS - Disturbed (Area 7b)	0	0	0	0	0	0	0	0	0	0	0	0	0
North RDS Undisturbed (Area 7b)	0	0	0	0	0	0	0	0	0	0	0	0	0
Northeast RDS - Disturbed (Area 13a)	0	0	0	0	0	0	0	0	0	0	0	0	0
Northeast RDS - Undisturbed (Area 13b)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mill Site													
With Slurry	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	12,803,366
Mill Site (Area 6)	18,857	0	0	0	13,746	36,233	35,784	32,805	23,621	26,727	13,752	16,775	218,300
Tailings Storage Facility (TSF)													
Tailings Pond Precipitation (Area 1)	89,491	89,664	89,152	52,847	42,069	56,123	77,157	155,687	112,099	126,839	65,283	79,809	1,036,000
Tailings Beach Runoff (Area 2)	32,217	0	0	0	23,485	61,904	61,136	56,047	40,356	45,662	23,495	28,659	372,960
Unprepared Area Tailings Facility (Area 3)	8,725	0	0	0	18,173	47,902	47,308	0	0	0	0	0	122,107
Biosolids Stockpile (Area 4)	1,534	0	0	0	1,118	2,948	2,911	2,669	1,922	2,174	1,119	1,365	17,760
Downstream Seepage Pond and Area (Area 9)	5,817	0	0	0	6,058	15,967	15,769	0	0	0	0	0	43,611
>>> Total	1,296,023	1,183,668	1,183,154	1,144,231	1,274,137	1,513,181	1,530,577	1,380,354	1,286,411	1,311,711	1,205,148	1,230,645	15,519,239
<WATER OUT OF TAILINGS IMPOUNDMENT> (m^3)													
Unrecoverable Water													
(-) Seepage Loss	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	70,080
(-) Water Retained in Tailings	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	2,322,817
(-) Evaporation from Supernatant Pond	0	0	0	0	0	0	65,800	156,800	149,800	128,800	70,000	21,000	592,200
(-) Groundwater and Seepage dicharge	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) TSF Surface Runoff discharged from the Seepage Pond	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total	199,408	199,408	199,408	199,408	199,408	199,408	265,208	356,208	349,208	328,208	269,408	220,408	2,985,097
Recoverable Water													
(-) Water Recycled to Mill + Dust Control Requirement (taken from Pit Water)	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	12,366,303
(+/-) Pond Water Accumulating or Lost	78,590	-33,767	-34,279	-73,203	56,704	295,748	222,343	-38,879	-105,822	-59,522	-107,285	-32,788	167,840
(-) Discharge to Caribou Pit	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Water Pumped to Wight Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Water Pumped to Bell Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Discharge from Seepage Recycle Ponds	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total	1,096,615	984,258	983,746	944,823	1,074,729	1,313,773	1,265,368	1,004,146	937,203	983,503	935,740	1,010,237	12,534,142
>>> Total	1,296,023	1,183,866	1,183,154	1,144,231	1,274,137	1,513,181	1,530,577	1,360,354	1,286,411	1,311,711	1,205,148	1,230,645	15,519,239
Monthly Water Available (excluding stored water in the TSF)	1,096,615	984,258	983,746	944,823	1,074,729	1,313,773	1,265,368	1,004,146	937,203	983,503	935,740	1,010,237	12,534,142
Available Stored Water in TSF at Beginning of Month	6,587,293	6,665,883	6,632,116	6,597,836	6,524,634	6,581,338	6,877,085	7,099,429	7,060,550	6,954,728	6,895,206	6,787,921	
Total Monthly Water Available	7,683,908	7,650,141	7,615,862	7,542,659	7,599,363	7,895,111	8,142,454	8,103,575	7,997,753	7,938,231	7,830,946	7,798,158	93,798,160
Water Required at Millsite													
Water for slurry	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	12,803,366
(-) Minimum Fresh Water Input to Mill (from groundwater wells)	25,807	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,807	25,607	25,607	25,607	307,281
(-) Water in Ore	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	279,782
Total Water Recycled to Mill	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	12,216,303
Water for Dust Control on Roads	0	0	0	0	0	0	25,000	25,000	25,000	25,000	25,000	25,000	150,000
Total Water Required	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	12,366,303
Water Surplus (Deficit) After Recycle to Process	78,590	(33,767)	(34,279)	(73,203)	56,704	295,748	222,343	(38,879)	(105,822)	(59,522)	(107,285)	(32,788)	167,840
Annual Cumulative Surplus (Deficit)	78,590	44,823	10,544	(62,659)	(5,955)	289,793	512,136	473,257	367,435	307,913	200,628	167,840	
<CARIBOO PIT> (m^3)													
Water Stored in Cariboo Pit at the Beginning of the Month	1,518,080	1,537,896	1,537,896	1,537,896	1,537,896	1,552,341	1,590,416	1,613,450	1,613,204	1,604,855	1,604,421	1,603,372	
Cariboo Pit Precipitation (Area 8)	19,816	0	0	0	14,445	38,078	37,604	34,474	24,822	28,086	14,451	17,628	229,400
Cariboo Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Cariboo Pit Evaporation	0	0	0	0	0	0	14,570	34,720	33,170	28,520	15,500	4,650	131,130
Water Pumped to the TSF from Cariboo Pit	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Pumped to Cariboo Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Stored in Cariboo Pit at the End of the Month	1,537,896	1,537,896	1,537,896	1,537,896	1,552,341	1,590,418	1,613,450	1,613,204	1,604,855	1,604,421	1,603,372	1,618,350	1,616,350
<WIGHT PIT> (m^3)													
Water Stored in Wight Pit at the Beginning of the Month	985,218	1,069,721	1,145,812	1,221,903	1,290,631	1,374,843	1,489,159	1,551,302	1,809,123	1,885,656	1,728,629	1,794,690	
Wight Pit Precipitation	10,867	0	0	0	7,921	20,880	20,621	18,905	13,612	15,402	7,925	9,667	125,800
Wight Pit Groundwater	73,836	76,091	76,091	68,727	76,091	73,636	76,091	73,636	76,091	76,091	73,636	76,091	895,909
Wight Pit Evaporation	0	0	0	0	0	0	14,570	34,720	33,170	28,520	15,500	4,650	131,130
Water Pumped to Wight Pit from the Northeast RDS	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Pumped to Wight Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Stored in Wight Pit at the End of the Month	1,069,721	1,145,812	1,221,903	1,290,631	1,374,643	1,469,159	1,551,302	1,609,123	1,665,656	1,728,629	1,794,690	1,875,797	1,875,797
<BELL PIT> (m^3)													
Water Stored in Bell Pit at the Beginning of the Month (pumped to TSF)	193,761	220,991	237,900	254,809	270,082	294,913	332,157	355,117	355,665	353,017	356,807	365,596	
Bell Pit Precipitation	10,867	0	0	0	7,921	20,880	20,621	18,905	13,612	15,402	7,925	9,667	125,800
Bell Pit Groundwater	16,364	16,909	16,909	15,273	16,909	16,364	16,909	16,364	16,909	16,909	16,364	16,909	199,091
Bell Pit Evaporation	0	0	0	0	0	0	14,570	34,720	33,170	28,520	15,500	4,650	131,130
Water Pumped to Bell Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Stored in Bell Pit at the End of the Month	220,991	237,900	254,809	270,082	294,913	332,157	355,117	355,665	353,017	356,807	365,596	387,522	387,522
Water in TSF at End of Month	6,665,883	6,632,116	6,597,836	6,524,634	6,581,338	6,877,085	7,099,429	7,060,550	6,954,728	6,895,206	6,787,921	6,755,133	6,755,133

Notes:
* The Bell Pit is already largely developed and will be developed to its ultimate surface area in Year 1. The pit is assumed to already be producing groundwater at its ultimate rate.
* The Wight Pit will be developed in Year 1. It's ultimate surface area will be disturbed Year 1 and it's ultimate depth will be reached in Year 3.
* The Springer Pit is developed in Year 2. It's ultimate surface Area is disturbed in Year 2 and its ultimate depth is reached in Year 7.
* The Northeast Rock Disposal Site (RDS) is developed in Year 1 to its ultimate surface area.
* Groundwater inflow to the pit is assumed to relate to pit depth, and therefore development time, so yearly inflow rates are estimated using a linear relationship between time and inflow rate.
* Groundwater infiltration is assumed to be 0 until pit devlopment commences and then estimated at 240 gpm for Bell and Springer Pits and 450 gpm for Wight Pit once they are fully developed.
* All waste rock will be placed in the Northeast RDS and the North and East RDS's will not be expanded past the current disturbed area.
* Water from all disturbed areas is captured and directed to the TSF (or Mill). The collection ditches closely surround the disturbed areas.
* Water from undisturbed areas is diverted away from mine features.
* Assumes no groundwater input or seepage to or from Cariboo Pit.

Revision 0 - Issued for Report

AMEC010450_0036

TABLE D-1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

SITE WATER BALANCE - NO DISCHARGE
YEAR 6

ASSUMPTIONS:

Solids Content 35%
Tailings S.G. = 2.65
Water Content of Ore = 4%
Dry Density (t/m^3) = 1.4
Initial Volume (m^3) = 6,755,133
Minimum Desired Volume = 1,000,000
Minimum Fresh Water Makeup = 2.4%
Underdrainage Recovery - Back to TSF (m^3)= 0
Initial Volume Cariboo Pit (m^3)= 1,616,350
Intitial Volume Wight Pit = 1,875,797
Initial Volume Bell Pit (m^3)= 387,522
Groundwater Seepage Loss (m^3/month) = 5,840

Discharge from Seepage Pond (Yes/no) no

Runoff Coefficients:

	General	Freshet	Low Flow Period
Unprepared Basin=	0.35	1	
Tailings Beach =	0.9	0.9	
Open Pit Area=	0.5	0.5	
Undisturbed RDS Areas =	0.24	1	0
Millsite Area =	0.50	0.5	
East RDS -Disturbed =	0.60	1	0
Downstream Tailings Areas =	0.7	1	
North RDS - Disturbed =	0.6	1	
Northeast RDS - Disturbed =	0.6	1	0

Areas:

Open Pits
Bell Pit (Area A) = 17
Diversion Efficiency = 100%
Springer Pit (Area B) = 36
Diversion Efficiency = 0%
Wight Pit (Area C) = 17
Diversion Efficiency = 100%
Cariboo Pit Area (Area D1) = 31
Cariboo Pit acts as a water storage pond

Rock Disposal Sites (RDS)
East Rock Disposal Site (RDS) - Disturbed (Area E1) = 55
Diversion Efficiency = 0%
East RDS - Undisturbed (Area E2) = 89
Diversion Efficiency = 0%
North RDS - Disturbed (Area F1) = 15
Diversion Efficiency = 100%
North RDS - Undisturbed (Area F2) = 1
Diversion Efficiency = 100%
Northeast RDS -Disturbed Area (Area G1) = 0
Diversion Efficiency = 100%
Northeast RDS - Un-Disturbed Area (Area G2) = 0
Diversion Efficiency = 100%

Assume Reclaimed

Mill Site
Millsite Area (Area H) = 59
Diversion Efficiency = 0%

Tailing Storage Facility (TSF)
Total Tailings Facility Area = 235.0
Pond Area (Area I) = 145.0
Beach Area (Area J) = 53.0

Unprepared Area (Area K) = 37.0
Biosolids Stockpile (Area L) = 4
Diversion Efficiency = 0%
Downstream Seepage Pond and Area (Area M) = 13
Diversion Efficiency = 0%

Groundwater Pumping Rate to the TSF		% to TSF
Cariboo Pit Groundwater Infiltration (m^3/mo) =	0	0
(gpm) =	0	
Wight Pit Groundwater Infiltration (m3/mo) =	76,091	0%
(gpm) =	450	
Bell Pit Groundwater Infiltration (m3/mo) =	16,909	0%
(gpm) =	100	
Springer Pit Groundwater Infiltration (m3/mo) =	33,818	100%
(gpm) =	200	

Note:
Water that reports to Cariboo Pit is stored in place and does not enter the TSF.

Water Pumped to Other Pits from the TSF

To Wight Pit (m3/year) = 0
To Cariboo Pit (m3/year) = 0
To Bell Pit (m3/year) = 0

Water Pumped to the TSF from Cariboo Pit
To TSF (m3/year) = 0

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Daily Ore Throughput (tpd) = 18888 18888 18888 18888 18888 18888 18888 18888 18888 18888 18888 18888 18888

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DESCRIPTION	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	ANNUAL
	2010												
Precipitation (mm/month)	64	64	64	38	30	40	55	111	80	91	47	57	740
% of Annual Precipitation	8.6%	8.7%	8.7%	5.1%	4.1%	5.4%	7.4%	15.0%	10.8%	12.2%	6.3%	7.7%	100%
Evaporation (mm/month)	0.0	0.0	0.0	0.0	0.0	0.0	47.0	112.0	107.0	92.0	50.0	15.0	423
Days per Month	30.0	31.0	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	365
<WATER INTO TAILINGS IMPOUNDMENT> (m^3)													
Open Pits													
Bell Pit (Area 7a)	0	0	0	0	0	0	0	0	0	0	0	0	0
Bell Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Springer Pit (Area 11)	11,506	0	0	0	8,387	22,108	21,834	20,017	14,413	16,308	8,391	10,235	133,200
Springer Pit Groundwater	32,727	33,818	33,818	30,545	33,818	32,727	33,818	32,727	33,818	33,818	32,727	33,818	398,182
Wight Pit (Area 12)	0	0	0	0	0	0	0	0	0	0	0	0	0
Wight Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Rock Disposal Sites (RDS)													
East RDS - Disturbed (Area 5a)	21,094	0	0	0	25,628	67,554	66,716	0	0	0	0	0	180,992
East RDS - Undisturbed (Area 5b)	13,654	0	0	0	41,471	109,314	107,959	0	0	0	0	0	272,398
North RDS - Disturbed (Area 7b)	0	0	0	0	0	0	0	0	0	0	0	0	0
North RDS Undisturbed (Area 7b)	0	0	0	0	0	0	0	0	0	0	0	0	0
Northeast RDS - Disturbed (Area 13a)	0	0	0	0	0	0	0	0	0	0	0	0	0
Northeast RDS - Undisturbed (Area 13b)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mill Site													
With Slurry	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	12,803,366
Mill Site (Area 6)	18,857	0	0	0	13,746	36,233	35,784	32,805	23,621	26,727	13,752	16,775	218,300
Tailings Storage Facility (TSF)													
Tailings Pond Precipitation (Area 1)	92,687	92,867	92,336	54,735	43,572	58,127	79,913	161,247	116,102	131,369	87,594	82,452	1,073,000
Tailings Beach Runoff (Area 2)	30,491	0	0	0	22,227	58,587	57,861	53,045	38,194	43,216	22,236	27,124	352,980
Unprepared Area Tailings Facility (Area 3)	8,278	0	0	0	17,241	45,445	44,882	0	0	0	0	0	115,846
Biosolids Stockpile (Area 4)	1,534	0	0	0	1,118	2,948	2,911	2,669	1,922	2,174	1,119	1,365	17,760
Downstream Seepage Pond and Area (Area 9)	5,817	0	0	0	6,058	15,967	15,769	0	0	0	0	0	43,611
>>> Total	1,303,592	1,193,632	1,193,101	1,152,227	1,280,213	1,515,958	1,534,395	1,369,457	1,295,017	1,320,559	1,212,766	1,238,717	15,609,634
<WATER OUT OF TAILINGS IMPOUNDMENT> (m^3)													
Unrecoverable Water													
(-) Seepage Loss	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	70,080
(-) Water Retained in Tailings	193,568	193,568	193,568	193,568	193,568	193,568	193,566	193,568	193,568	193,568	193,568	193,568	2,322,817
(-) Evaporation from Supernatant Pond	0	0	0	0	0	0	68,150	162,400	155,150	133,400	72,500	21,750	613,350
(-) Groundwater and Seepage dicharge	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) TSF Surface Runoff discharged from the Seepage Pond	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total	199,408	199,408	199,408	199,408	199,408	199,408	267,558	361,808	354,558	332,808	271,908	221,158	3,006,247
Recoverable Water													
(-) Water Recycled to Mill + Dust Control Requirement (taken from Pit Water)	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	12,366,303
(+/-) Pond Water Accumulating or Lost	86,158	-23,801	-24,332	-65,206	62,780	298,525	223,811	-35,376	-102,567	-55,275	-102,168	-25,466	237,084
(-) Discharge to Caribou Pit	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Water Pumped to Wight Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Water Pumped to Bell Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Discharge from Seepage Recycle Ponds	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total	1,104,184	994,224	993,693	952,819	1,080,805	1,316,550	1,266,837	1,007,649	940,459	987,751	940,858	1,017,559	12,603,387
>>> Total	1,303,592	1,193,632	1,193,101	1,152,227	1,280,213	1,515,958	1,534,395	1,369,457	1,295,017	1,320,559	1,212,766	1,238,717	15,609,634
Monthly Water Available (excluding stored water in the TSF)	1,104,184	994,224	993,693	952,819	1,080,805	1,316,550	1,266,837	1,007,849	940,459	987,751	940,858	1,017,559	12,603,387
Available Stored Water in TSF at Beginning of Month	6,755,133	6,841,291	6,817,490	6,793,158	6,727,952	6,790,732	7,089,257	7,313,068	7,277,692	7,175,125	7,119,851	7,017,683	
Total Monthly Water Available	7,859,316	7,835,515	7,811,183	7,745,977	7,808,757	8,107,282	8,356,093	8,320,717	8,218,151	8,162,876	8,060,708	8,035,242	96,321,818
Water Required at Millsite													
Water for slurry	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	12,803,366
(-) Minimum Fresh Water Input to Mill (from groundwater wells)	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	307,281
(-) Water in Ore	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	279,782
Total Water Recycled to Mill	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	12,216,303
Water for Dust Control on Roads	0	0	0	0	0	0	25,000	25,000	25,000	25,000	25,000	25,000	150,000
Total Water Required	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	12,366,303
Water Surplus (Deficit) After Recycle to Process	86,158	(23,801)	(24,332)	(65,206)	62,780	298,525	223,811	(35,376)	(102,567)	(55,275)	(102,168)	(25,466)	237,084
Annual Cumulative Surplus (Deficit)	86,158	62,357	38,025	(27,181)	35,599	334,124	557,935	522,559	419,993	364,718	262,551	237,084	
<CARIBOO PIT> (m^3)													
Water Stored in Cariboo Pit at the Beginning of the Month	1,616,350	1,636,166	1,636,166	1,636,166	1,636,166	1,650,611	1,688,686	1,711,720	1,711,474	1,703,125	1,702,691	1,701,642	
Cariboo Pit Precipitation (Area 8)	19,816	0	0	0	14,445	38,076	37,604	34,474	24,822	28,086	14,451	17,628	229,400
Cariboo Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Cariboo Pit Evaporation	0	0	0	0	0	0	14,570	34,720	33,170	28,520	15,500	4,650	131,130
Water Pumped to the TSF from Cariboo Pit	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Pumped to Cariboo Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Stored in Cariboo Pit at the End of the Month	1,636,166	1,636,166	1,636,166	1,636,166	1,650,611	1,688,686	1,711,720	1,711,474	1,703,125	1,702,691	1,701,642	1,714,620	1,714,620
<WIGHT PIT> (m^3)													
Water Stored in Wight Pit at the Beginning of the Month	1,875,797	1,960,301	2,036,391	2,112,482	2,181,210	2,265,222	2,359,739	2,441,881	2,499,702	2,556,235	2,619,208	2,685,269	
Wight Pit Precipitation	10,667	0	0	0	7,921	20,880	20,621	18,905	13,612	15,402	7,925	9,667	125,800
Wight Pit Groundwater	73,836	76,091	76,091	68,727	76,091	73,636	76,091	73,636	76,091	76,091	73,636	76,091	895,909
Wight Pit Evaporation	0	0	0	0	0	0	14,570	34,720	33,170	28,520	15,500	4,650	131,130
Water Pumped to Wight Pit from the Northeast RDS	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Pumped to Wight Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Stored in Wight Pit at the End of the Month	1,960,301	2,036,391	2,112,482	2,181,210	2,265,222	2,359,739	2,441,881	2,499,702	2,556,235	2,619,208	2,685,269	2,766,377	2,766,377
<BELL PIT> (m^3)													
Water Stored in Bell Pit at the Beginning of the Month (pumped to TSF)	387,522	414,752	431,661	448,570	463,843	488,674	525,917	548,878	549,426	546,777	550,568	559,357	
Bell Pit Precipitation	10,867	0	0	0	7,921	20,880	20,621	18,905	13,612	15,402	7,925	9,667	125,800
Bell Pit Groundwater	16,364	16,909	16,909	15,273	16,909	16,364	16,909	16,364	16,909	16,909	16,364	16,909	199,091
Bell Pit Evaporation	0	0	0	0	0	0	14,570	34,720	33,170	28,520	15,500	4,650	131,130
Water Pumped to Bell Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Stored in Bell Pit at the End of the Month	414,752	431,661	448,570	463,843	488,674	525,917	548,878	549,426	546,777	550,568	559,357	581,283	581,283
Water in TSF at End of Month	6,841,291	6,817,490	6,793,158	6,727,952	6,790,732	7,089,257	7,313,068	7,277,692	7,175,125	7,119,851	7,017,683	6,992,217	6,992,217

Notes:
* The Bell Pit is already largely developed and will be developed to its ultimate surface area in Year 1. The pit is assumed to already be producing groundwater at its ultimate rate.
* The Wight Pit will be developed in Year 1. It's ultimate surface area will be disturbed Year 1 and it's ultimate depth will be reached in Year 3
* The Springer Pit is developed in Year 2. It's ultimate surface Area is disturbed in Year 2 and its ultimate depth is reached in Year 7.
* The Northeast Rock Disposal Site (RDS) is developed in Year 1 to its ultimate surface area.
* Groundwater inflow to the pit is assumed to relate to pit depth, and therefore development time, so yearly inflow rates are estimated using a linear relationship between time and inflow rate.
* Groundwater infiltration is assumed to be 0 until pit devlopment commences and then estimated at 240 gpm for Bell and Springer Pits and 450 gpm for Wight Pit once they are fully developed.
* All waste rock will be placed in the Northeast RDS and the North and East RDS's will not be expanded past the current disturbed area.
* Water from all disturbed areas is captured and directed to the TSF (or Mill). The collection ditches closely surround the disturbed areas.
* Water from undisturbed areas is diverted away from mine features.
* Assumes no groundwater input or seepage to or from Cariboo Pit.

Revision 0 - Issued for Report

TABLE D-1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

SITE WATER BALANCE - NO DISCHARGE
YEAR 7

ASSUMPTIONS:

Solids Content 35%
Tailings S.G. = 2.65
Water Content of Ore = 4%
Dry Density (t/m^3) = 1.4
Initial Volume (m^3) = 6,992,217
Minimum Desired Volume = 1,000,000
Minimum Fresh Water Makeup = 2.4%
Underdrainage Recovery - Back to TSF (m^3)= 0
Initial Volume Cariboo Pit (m^3)= 1,714,620
Intilial Volume Wight Pit = 2,766,377
Initial Volume Bell Pit (m^3)= 581,283
Groundwater Seepage Loss (m^3/month) = 5,840

Discharge from Seepage Pond (Yes/no) no

Runoff Coefficients:

	General	Freshet	Low Flow Period
Unprepared Basin=	0.35	1	
Tailings Beach =	0.9	0.9	
Open Pit Area=	0.5	0.5	
Undisturbed RDS Areas =	0.24	1	0
Millsite Area =	0.50	0.5	
East RDS -Disturbed =	0.60	1	0
Downstream Tailings Areas =	0.7	1	
North RDS - Disturbed =	0.6	1	
Northeast RDS - Disturbed =	0.6	1	0

Areas:

Open Pits
Bell Pit (Area A) = 17
Diversion Efficiency = 100%
Springer Pit (Area B) = 36
Diversion Efficiency = 0%
Wight Pit (Area C) = 17
Diversion Efficiency = 100%
Cariboo Pit Area (Area D1) = 31
Cariboo Pit acts as a water storage pond

Rock Disposal Sites (RDS)
East Rock Disposal Site (RDS) - Disturbed (Area E1) = 55
Diversion Efficiency = 0%
East RDS - Undisturbed (Area E2) = 89
Diversion Efficiency = 0%
North RDS - Disturbed (Area F1) = 16
Diversion Efficiency = 100%
North RDS - Undisturbed (Area F2) = 0
Diversion Efficiency = 100%
Northeast RDS -Disturbed Area (Area G1) = 0
Diversion Efficiency = 100%
Northeast RDS - Un-Disturbed Area (Area G2) = 0
Diversion Efficiency = 100%

Mill Site
Millsite Area (Area H) = 59
Diversion Efficiency = 0%

Tailing Storage Facility (TSF)
Total Tailings Facility Area = 235.0
Pond Area (Area I) = 150.0
Beach Area (Area J) = 50.0

Unprepared Area (Area K) = 35.0
Biosolids Stockpile (Area L) = 4
Diversion Efficiency = 0%
Downstream Seepage Pond and Area (Area M) = 13
Diversion Efficiency = 0%

Assume reclaimed

Groundwater Pumping Rate to the TSF		% to TSF
Cariboo Pit Groundwater Infiltration (m^3/mo) =	0	0
(gpm) =	0	
Wight Pit Groundwater Infiltration (m3/mo) =	76,091	0%
(gpm) =	450	
Bell Pit Groundwater Infiltration (m3/mo) =	16,909	0%
(gpm) =	100	
Springer Pit Groundwater Infiltration (m3/mo) =	40,582	100%
(gpm) =	240	

Note:
Water that reports to Cariboo Pit is stored in place and does not enter the TSF.

Water Pumped to Other Pits from the TSF
To Wight Pit (m3/year) = 0
To Cariboo Pit (m3/year) = 0
To Bell Pit (m3/year) = 0

Water Pumped to the TSF from Cariboo Pit
To TSF (m3/year) = 0

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Daily Ore Throughput (tpd) =	18888	18888	18888	18888	18888	18888	18888	18888	18888	18888	18888	18888	
					2011								
DESCRIPTION	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	ANNUAL
Precipitation (mm/month)	64	64	64	38	30	40	55	111	80	91	47	57	740
% of Annual Precipitation	8.6%	8.7%	8.7%	5.1%	4.1%	5.4%	7.4%	15.0%	10.8%	12.2%	6.3%	7.7%	100%
Evaporation (mm/month)	0.0	0.0	0.0	0.0	0.0	0.0	47.0	112.0	107.0	92.0	50.0	15.0	423
Days per Month	30.0	31.0	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	365
<WATER INTO TAILINGS IMPOUNDMENT> (m^3)													
Open Pits													
Bell Pit (Area 7a)	0	0	0	0	0	0	0	0	0	0	0	0	0
Bell Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Springer Pit (Area 11)	11,506	0	0	0	8,387	22,108	21,834	20,017	14,413	16,308	8,391	10,235	133,200
Springer Pit Groundwater	39,273	40,582	40,582	36,655	40,582	39,273	40,582	39,273	40,582	40,582	39,273	40,582	477,818
Wight Pit (Area 12)	0	0	0	0	0	0	0	0	0	0	0	0	0
Wight Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Rock Disposal Sites (RDS)													
East RDS - Disturbed (Area 5a)	21,094	0	0	0	25,628	67,554	66,716	0	0	0	0	0	180,992
East RDS - Undisturbed (Area 5b)	13,654	0	0	0	41,471	109,314	107,959	0	0	0	0	0	272,398
North RDS - Disturbed (Area 7b)	0	0	0	0	0	0	0	0	0	0	0	0	0
North RDS Undisturbed (Area 7b)	0	0	0	0	0	0	0	0	0	0	0	0	0
Northeast RDS - Disturbed (Area 13a)	0	0	0	0	0	0	0	0	0	0	0	0	0
Northeast RDS - Undisturbed (Area 13b)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mill Site													
With Slurry	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,068,947	1,066,947	1,066,947	1,066,947	12,803,366
Mill Site (Area 6)	18,857	0	0	0	13,746	38,233	35,784	32,805	23,621	26,727	13,752	16,775	218,300
Tailings Storage Facility (TSF)													
Tailings Pond Precipitation (Area 1)	95,883	96,069	95,520	56,622	45,074	60,131	82,668	166,607	120,106	135,899	69,925	85,296	1,110,000
Tailings Beach Runoff (Area 2)	28,765	0	0	0	20,969	55,271	54,586	50,042	36,032	40,770	20,977	25,589	333,000
Unprepared Area Tailings Facility (Area 3)	7,830	0	0	0	16,309	42,989	42,456	0	0	0	0	0	109,584
Biosolids Stockpile (Area 4)	1,534	0	0	0	1,118	2,948	2,911	2,669	1,922	2,174	1,119	1,365	17,760
Downstream Seepage Pond and Area (Area 9)	5,817	0	0	0	6,056	15,967	15,769	0	0	0	0	0	43,611
>>> Total	1,311,160	1,203,598	1,203,049	1,160,224	1,286,289	1,518,735	1,538,213	1,378,561	1,303,622	1,329,406	1,220,383	1,246,788	15,700,028
<WATER OUT OF TAILINGS IMPOUNDMENT> (m^3)													
Unrecoverable Water													
(-) Seepage Loss	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	70,080
(-) Water Retained in Tailings	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,566	2,322,817
(-) Evaporation from Supernatant Pond	0	0	0	0	0	0	70,500	168,000	160,500	138,000	75,000	22,500	634,500
(-) Groundwater and Seepage dicharge	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) TSF Surface Runoff discharged from the Seepage Pond	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total	199,408	199,408	199,408	199,408	199,408	199,408	269,908	367,408	359,908	337,408	274,408	221,908	3,027,397
Recoverable Water													
(-) Water Recycled to Mill + Dust Control Requirement (taken from Pit Water)	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	12,366,303
(+/-) Pond Water Accumulating or Lost	93,727	-13,835	-14,384	-57,210	68,856	301,302	225,279	-31,673	-99,311	-51,027	-97,050	-18,145	306,329
(-) Discharge to Caribou Pit	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Water Pumped to Wight Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Water Pumped to Bell Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Discharge from Seepage Recycle Ponds	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total	1,111,752	1,004,190	1,003,641	960,816	1,086,881	1,319,327	1,268,305	1,011,153	943,714	991,998	945,975	1,024,880	12,672,631
>>> Total	1,311,160	1,203,598	1,203,049	1,160,224	1,286,289	1,518,735	1,538,213	1,378,561	1,303,622	1,329,406	1,220,383	1,246,788	15,700,028
Monthly Water Available (excluding stored water in the TSF)	1,111,752	1,004,190	1,003,641	960,816	1,086,881	1,319,327	1,268,305	1,011,153	943,714	991,998	945,975	1,024,880	12,672,631
Available Stored Water in TSF at Beginning of Month	6,992,217	7,085,943	7,072,108	7,057,724	7,000,514	7,069,370	7,370,672	7,595,951	7,564,079	7,464,768	7,413,740	7,316,690	
Total Monthly Water Available	8,103,969	8,090,133	8,075,749	8,018,539	8,087,395	6,388,697	8,638,977	8,607,104	8,507,793	8,456,765	8,359,718	8,341,571	99,676,408
Water Required at Millsite													
Water for slurry	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	12,803,366
(-) Minimum Fresh Water Input to Mill (from groundwater wells)	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	307,281
(-) Water in Ore	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	279,782
Total Water Recycled to Mill	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	12,216,303
Water for Dust Control on Roads	0	0	0	0	0	0	25,000	25,000	25,000	25,000	25,000	25,000	150,000
Total Water Required	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	12,366,303
Water Surplus (Deficit) After Recycle to Process	93,727	(13,835)	(14,384)	(57,210)	68,856	301,302	225,279	(31,673)	(99,311)	(51,027)	(97,050)	(18,145)	306,329
Annual Cumulative Surplus (Deficit)	93,727	79,891	65,507	8,297	77,153	378,455	603,735	571,862	472,551	421,523	324,474	306,329	306,329
<CARIBOO PIT> (m^3)													
Water Stored in Cariboo Pit at the Beginning of the Month	1,714,620	1,734,436	1,734,436	1,734,436	1,734,436	1,748,881	1,786,956	1,809,990	1,809,744	1,801,395	1,800,961	1,799,912	
Cariboo Pit Precipitation (Area 8)	19,816	0	0	0	14,445	38,076	37,604	34,474	24,822	28,086	14,451	17,628	229,400
Cariboo Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Cariboo Pit Evaporation	0	0	0	0	0	0	14,570	34,720	33,170	28,520	15,500	4,650	131,130
Water Pumped to the TSF from Cariboo Pit	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Pumped to Cariboo Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Stored in Cariboo Pit at the End of the Month	1,734,436	1,734,436	1,734,436	1,734,436	1,748,881	1,786,956	1,809,990	1,809,744	1,801,395	1,800,961	1,799,912	1,812,890	1,812,890
<WIGHT PIT> (m^3)													
Water Stored in Wight Pit at the Beginning of the Month	2,766,377	2,850,880	2,926,971	3,003,061	3,071,789	3,155,801	3,250,318	3,332,460	3,390,281	3,446,814	3,509,787	3,575,848	
Wight Pit Precipitation	10,867	0	0	0	7,921	20,880	20,621	18,905	13,612	15,402	7,925	9,667	125,800
Wight Pit Groundwater	73,636	76,091	76,091	68,727	76,091	73,636	76,091	73,636	76,091	76,091	73,636	76,091	895,909
Wight Pit Evaporation	0	0	0	0	0	0	14,570	34,720	33,170	28,520	15,500	4,650	131,130
Water Pumped to Wight Pit from the Northeast RDS	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Pumped to Wight Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Stored in Wight Pit at the End of the Month	2,850,880	2,926,971	3,003,061	3,071,789	3,155,801	3,250,318	3,332,460	3,390,281	3,446,814	3,509,787	3,575,848	3,656,956	3,656,956
<BELL PIT> (m^3)													
Water Stored in Bell Pit at the Beginning of the Month (pumped to TSF)	581,283	608,513	625,422	642,331	657,604	882,435	719,678	742,639	743,187	740,538	744,329	753,118	
Bell Pit Precipitation	10,867	0	0	0	7,921	20,880	20,621	18,905	13,612	15,402	7,925	9,667	125,800
Bell Pit Groundwater	16,364	15,909	16,909	15,273	16,909	16,364	16,909	16,364	16,909	16,909	16,364	16,909	199,091
Bell Pit Evaporation	0	0	0	0	0	0	14,570	34,720	33,170	28,520	15,500	4,650	131,130
Water Pumped to Bell Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Stored in Bell Pit at the End of the Month	608,513	825,422	642,331	657,604	682,435	719,678	742,639	743,187	740,538	744,329	753,118	775,044	775,044
Water in TSF at End of Month	7,085,943	7,072,108	7,057,724	7,000,514	7,069,370	7,370,672	7,595,951	7,564,079	7,464,768	7,413,740	7,316,690	7,298,545	7,298,545

Notes:
* The Bell Pit is already largely developed and will be developed to its ultimate surface area in Year 1. The pit is assumed to already be producing groundwater at its ultimate rate.
* The Wight Pit will be developed in Year 1. It's ultimate surface area will be disturbed Year 1 and it's ultimate depth will be reached in Year 3.
* The Springer Pit is developed in Year 2. It's ultimate surface Area is disturbed in Year 2 and its ultimate depth is reached in Year 7.
* The Northeast Rock Disposal Site (RDS) is developed in Year 1 to its ultimate surface area.
* Groundwater inflow to the pit is assumed to relate to pit depth, and therefore development time, so yearly inflow rates are estimated using a linear relationship between time and inflow rate.
* Groundwater infiltration is assumed to be 0 until pit devlopment commences and then estimated at 240 gpm for Bell and Springer Pits and 450 gpm for Wight Pit once they are fully developed.
* All waste rock will be placed in the Northeast RDS and the North and East RDS's will not be expanded past the current disturbed area.
* Water from all disturbed areas is captured and directed to the TSF (or Mill). The collection ditches closely surround the disturbed areas.
* Water from undisturbed areas is diverted away from mine features.
* Assumes no groundwater input or seepage to or from Cariboo Pit.

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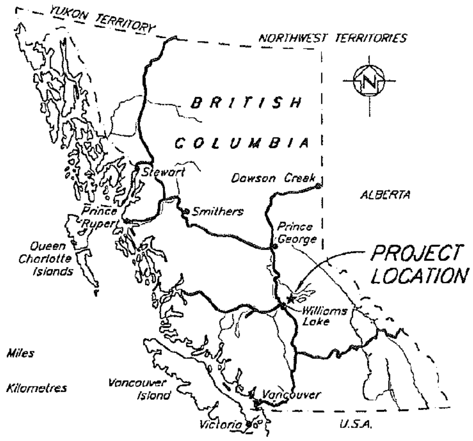
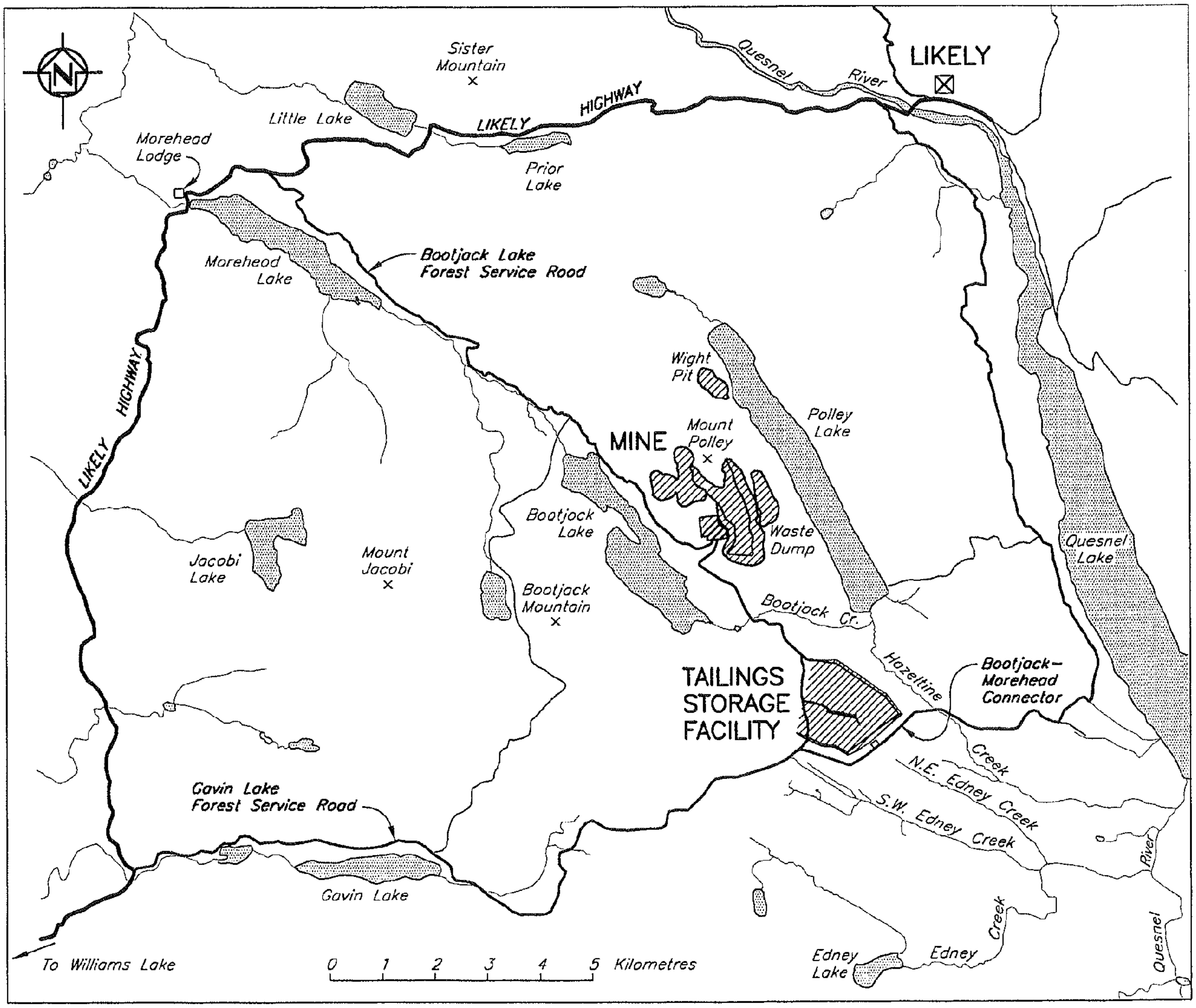


KEY MAP



LOCATION MAP

MOUNT POLLEY MINING CORPORATION	
MOUNT POLLEY MINE	
PROJECT LOCATION AND ACCESS PLAN	

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.	REV.
VA101-1/8	1	0

FIGURE 1.1

REV.	DATE	DESCRIPTION
REV. 0	09MAR'05	ISSUED FOR REPORT

XREF FILE: -

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

AERIAL PHOTOGRAPH OF MOUNT POLLEY MINE

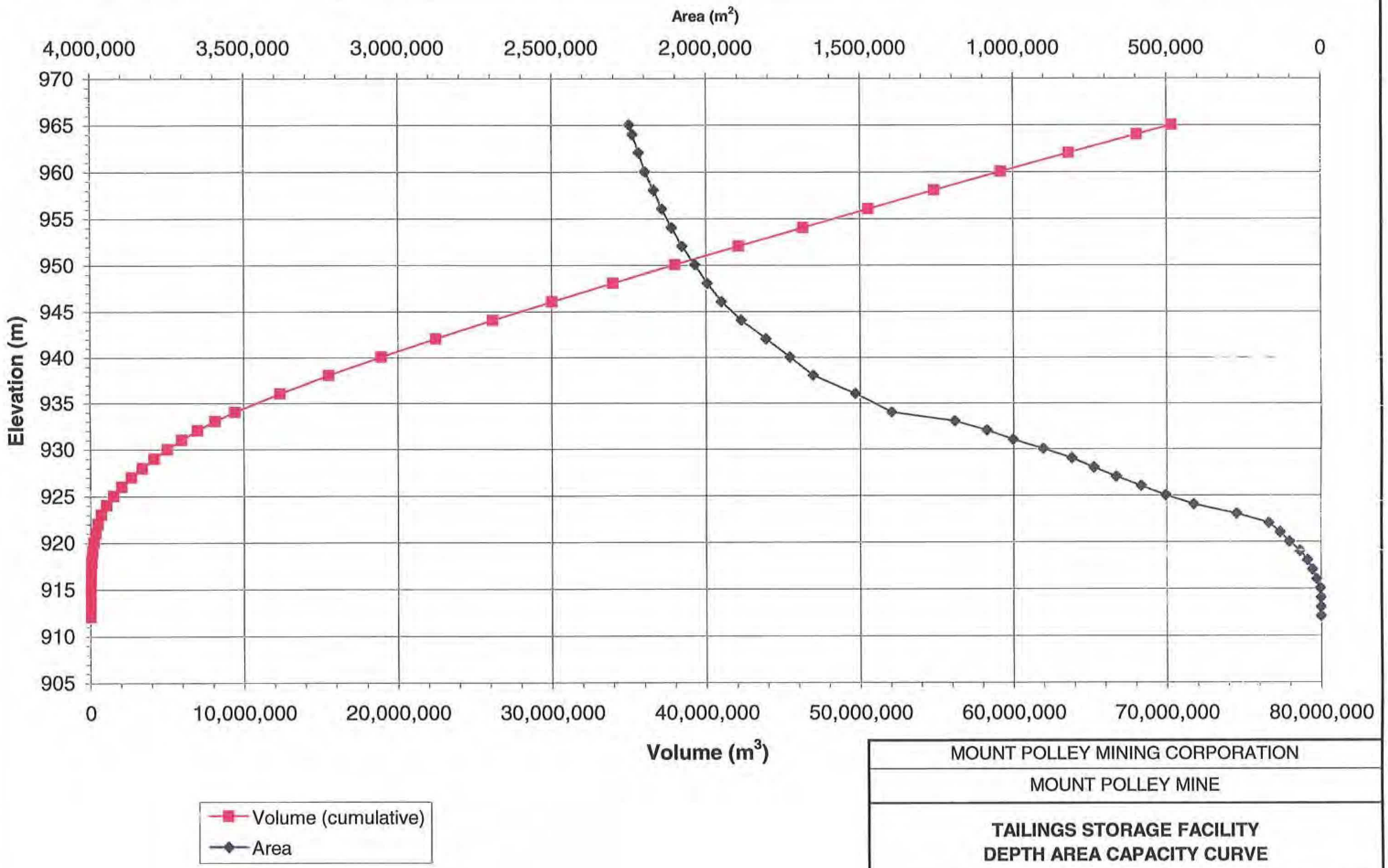
	PROJECT / ASSIGNMENT NO.	REF NO.	REV
Knight Piésold CONSULTING	VA 101-1/8	1	0

FIGURE 1.2

Rev 0 - Issued for Report

M:\1\01\00001\08\A\Report\Report1\Figures\Figure 2.1.xls Figure 2.1 Rev 0

Print 3/11/2005
Rev'd 02/21/05

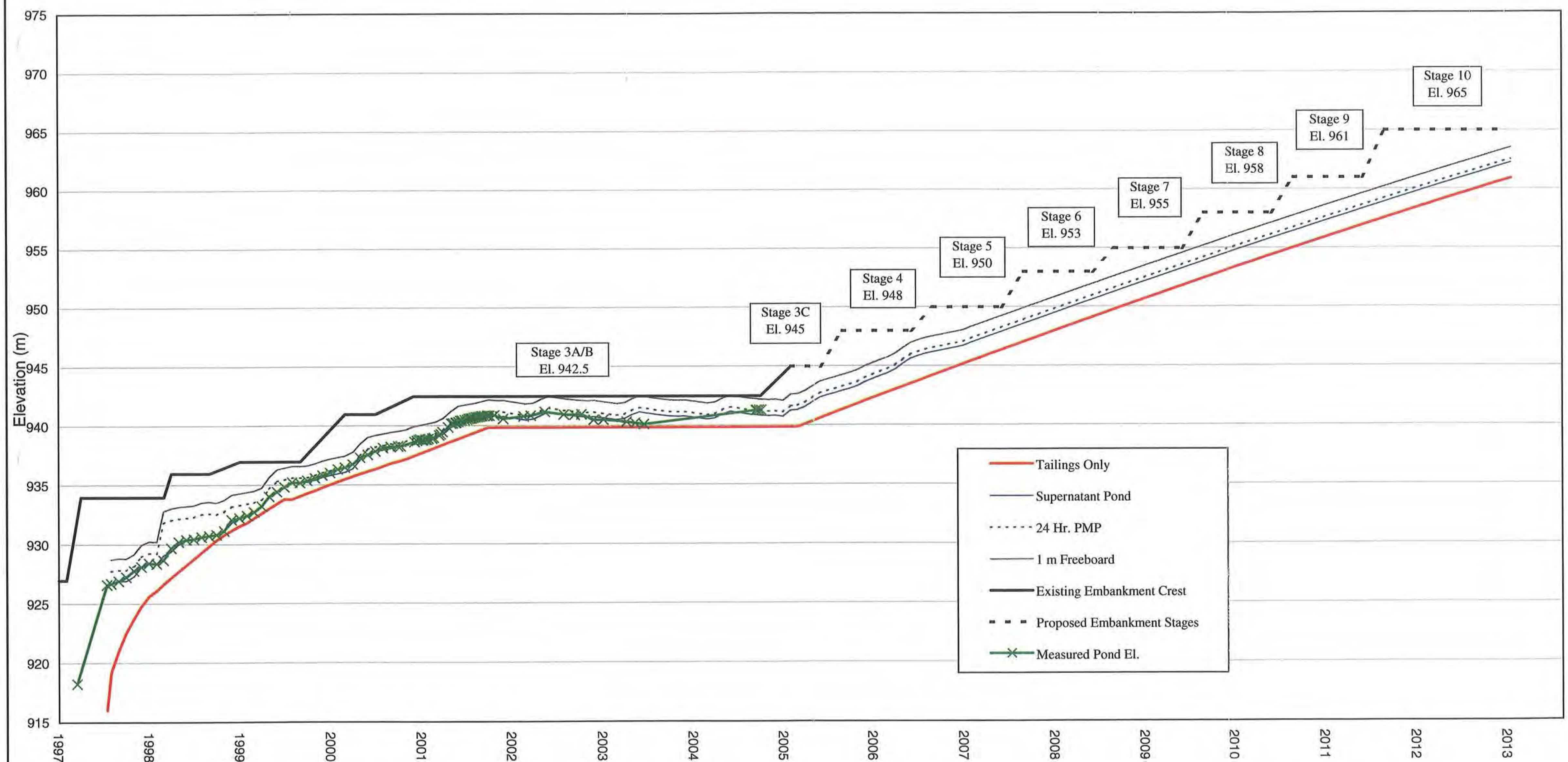


MOUNT POLLEY MINING CORPORATION			
MOUNT POLLEY MINE			
TAILINGS STORAGE FACILITY DEPTH AREA CAPACITY CURVE			
Knight Piésold CONSULTING	PROJECT / ASSIGNMENT NO. VA 101-1/8	REF NO. 1	REV. 0
	FIGURE 2.1		

Rev 0 - Issued for Report

M:\1\01\00001\08\A\Report\Report1\Figures\Figure 2.2.xls Figure 2.2 Rev 0

Printed 3/15/2005
Rev'd 03/11/05



Notes:
1. Production rate is estimated at 20,000 tpd.
2. Projected bulk tailings dry density is 1.36 t/m³ for tailings reporting to the TSF after August 2000.
3. Supernatant pond volume estimated at 3,000,000 m³.
4. The filling schedule will be updated as required to reflect actual mine throughput and the supernatant pond volume.

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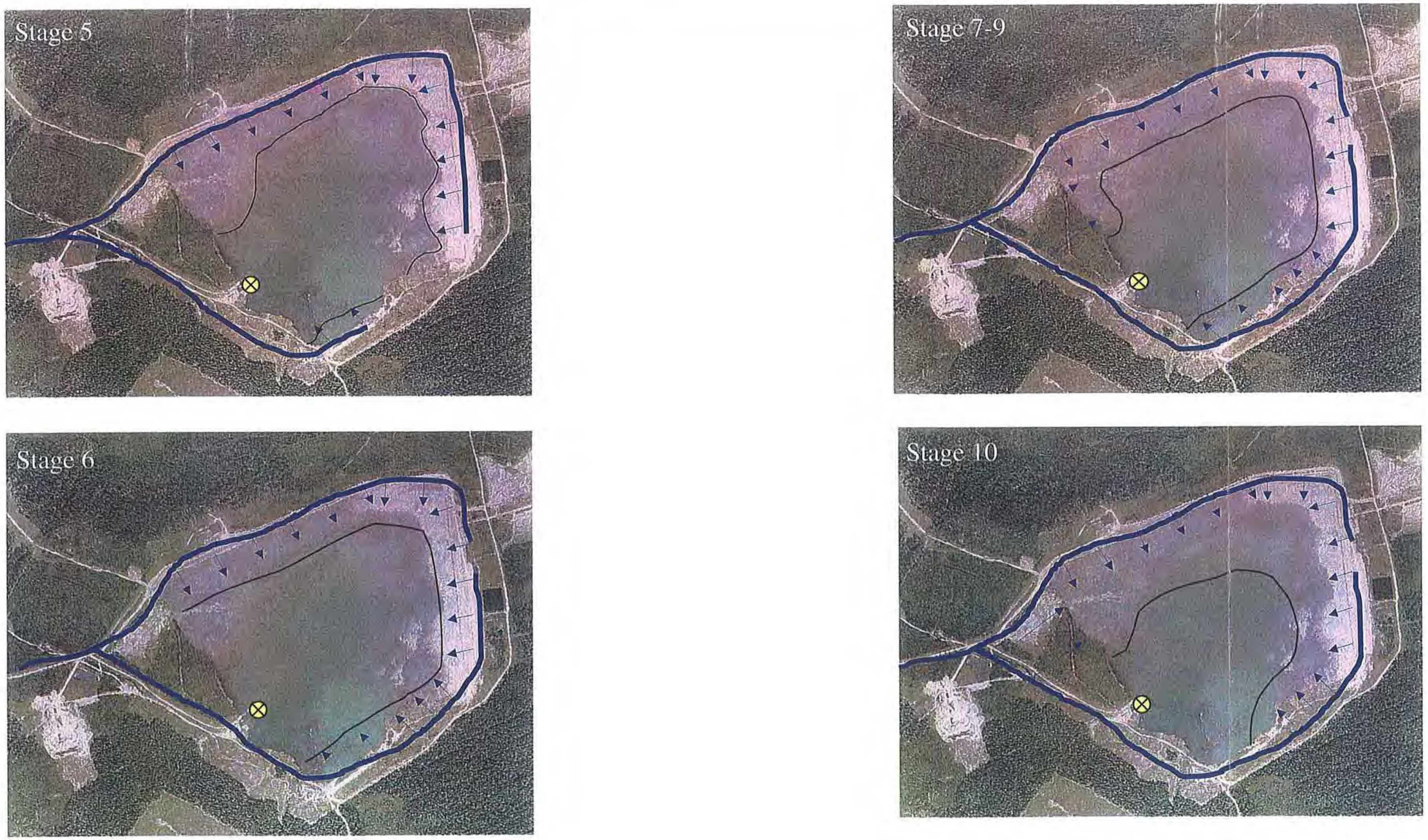
MOUNT POLLEY MINING CORPORATION			
MOUNT POLLEY MINE			
TAILINGS STORAGE FACILITY FILLING SCHEDULE			
Knight Piésold CONSULTING	PROJECT NO. VA 101-1/8	REF. 1	REV 0
	FIGURE 2.2		

AMEC010450_0042



= Reclaim Barge

= Proposed Tailings Delivery Pipelines

= Proposed Tailings Discharge Locations

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MOUNT POLLEY MINING CORPORATION

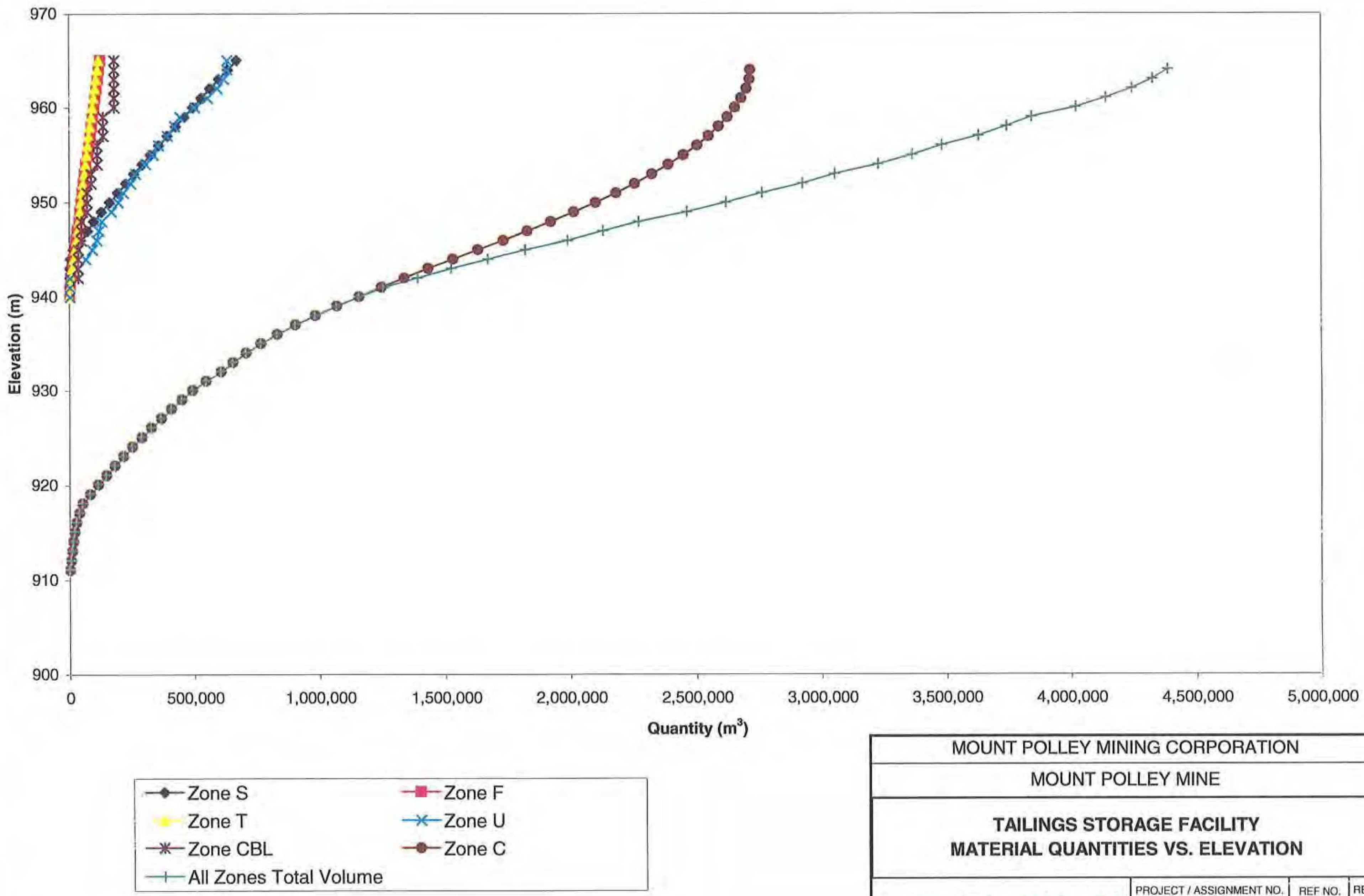
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
TAILINGS DEPOSITIONAL STRATEGY
STAGE 5 to STAGE 10

Knight Piésold CONSULTING

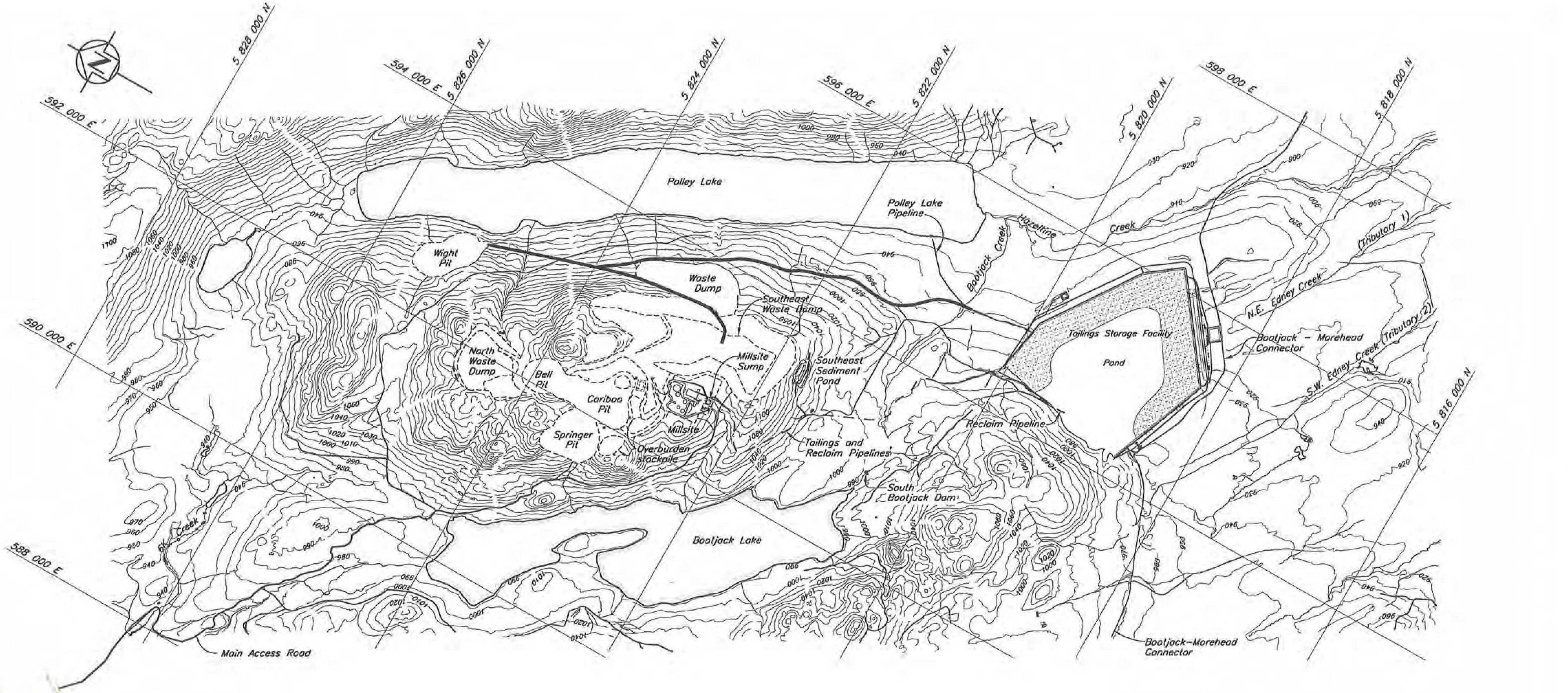
PROJECT / ASSIGNMENT NO.	REF NO.	REV:
VA 101-1/8	1	0

FIGURE 2.3



Rev 0 - Issued for Report

MOUNT POLLEY MINING CORPORATION			
MOUNT POLLEY MINE			
TAILINGS STORAGE FACILITY **MATERIAL QUANTITIES VS. ELEVATION**			
Knight Piésold CONSULTING	PROJECT / ASSIGNMENT NO. VA 101-1/8	REF NO. 1	REV. 0
	FIGURE 2.4		



NOT FOR CONSTRUCTION

Scale 400 0 400 800 1200 1600 2000 m

NOTES

1. Open Pits and Waste Dumps are shown in their final configurations.
2. Topography at TSF generated from points and break lines sent from MPMC in July 1999. The topography outside the TSF area is from 1997 flyover. UTM, NAD83, ZONE 10.
3. Drawing is for reference only.

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PROVINCE ... L.J. GOTT ... 25493 ... ENGINEER

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MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
ULTIMATE TAILINGS EMBANKMENT
OVERALL SITE PLAN

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	100	0

DRG. NO.	DESCRIPTION
REFERENCE DRAWINGS	

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	JT		KJB

REVISIONS

XREF FILE : TOPO09

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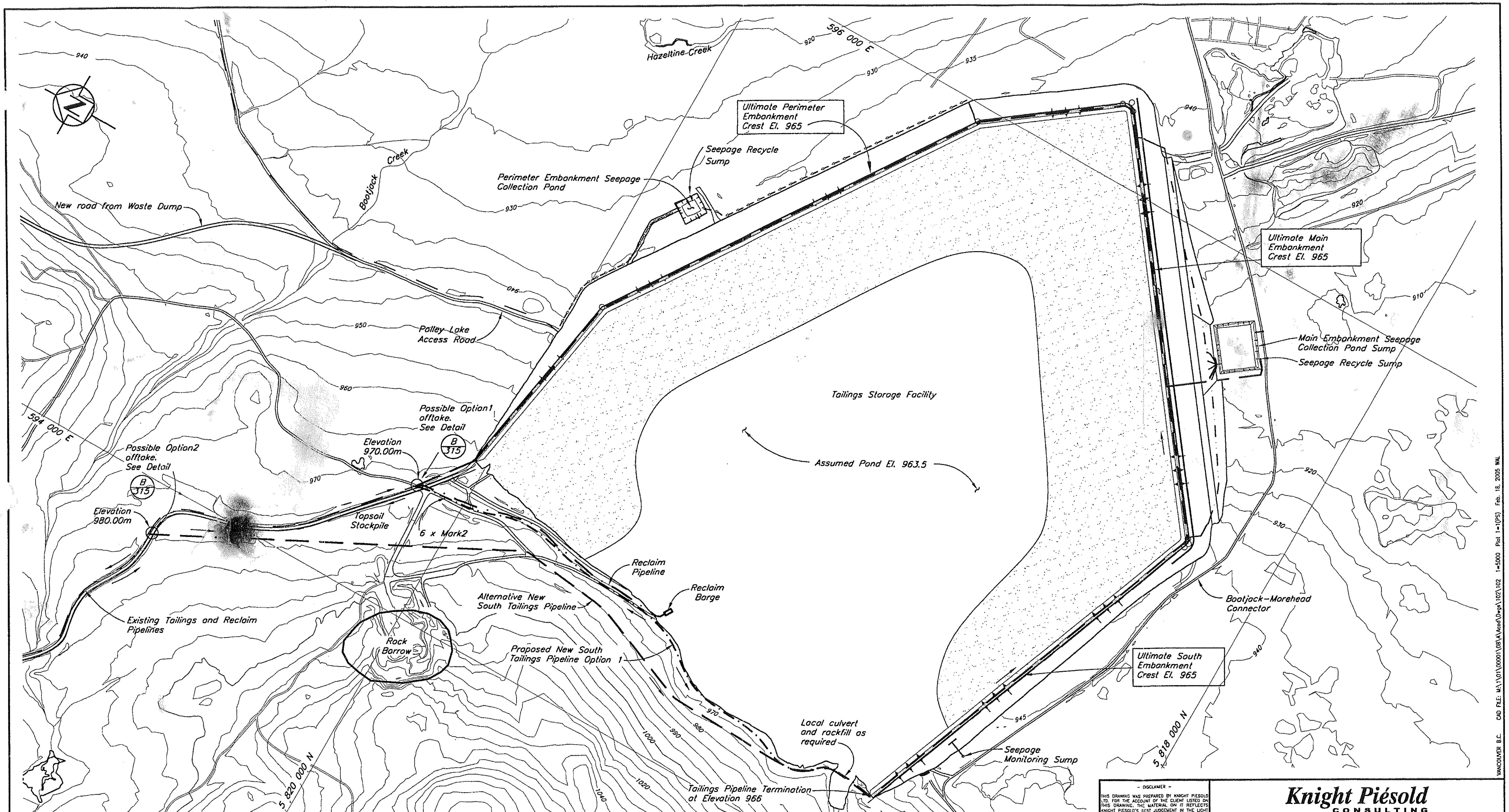

NOTES

1. Topography from 2004 Flyover
2. All dimensions in millimetres and elevations in metres, unless noted otherwise.
3. Drawing is for reference only.

NOT FOR CONSTRUCTION

Scale 100 0 100 200 300 400 500m

DRG. NO.	DESCRIPTION
315	TAILINGS PIPEWORK – DETAILS
310	TAILINGS PIPEWORK OPTIONS – STAGGE 4 – PLAN

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	HPD	LAK		

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PROFESSIONAL ENGINEER
L.J. GALBRAITH
25493
BRITISH COLUMBIA

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CONSULTING

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
GENERAL ARRANGEMENT
ULTIMATE CREST ELEVATION

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	102	0

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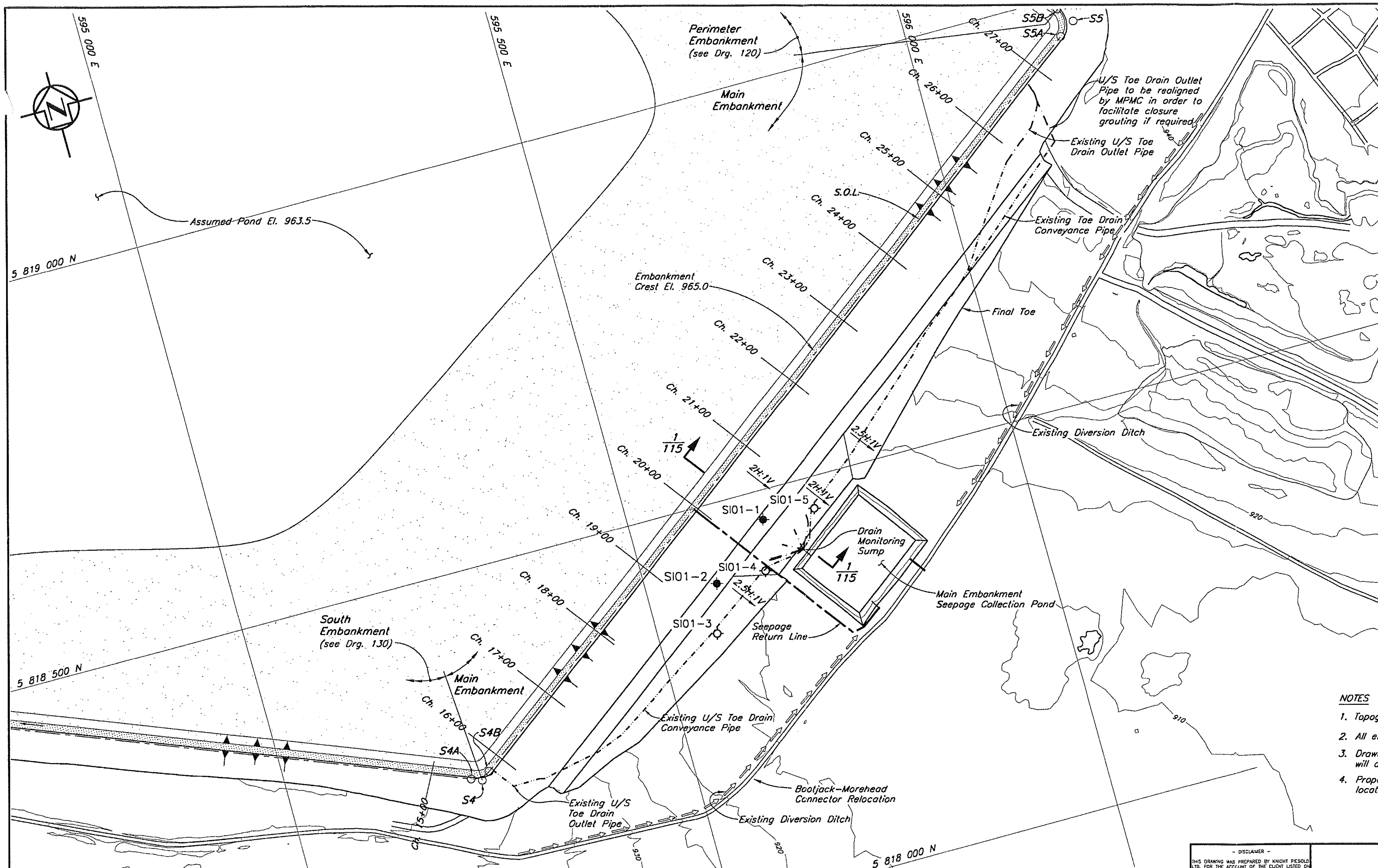

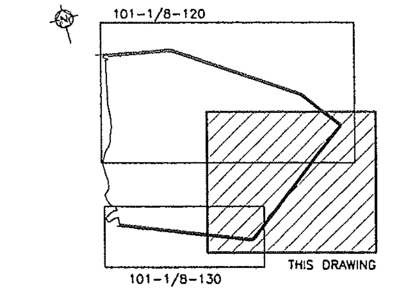

KEY PLAN

NOTES

1. Topography from 2004 flyover.
2. All elevations in metres, unless noted otherwise.
3. Drawing is for reference only. Actual configuration will depend on construction as-builts.
4. Proposed locations for slope inclinometers. Actual locations will be determined after ongoing reviews.

LEGEND

- Existing Inclinometer
- Proposed Inclinometer

NOT FOR CONSTRUCTION

Scale 50 0 50 100 150 200 250 Metres

DRG. NO.	DESCRIPTION
130	ULTIMATE SOUTH EMBANKMENT – PLAN
120	ULTIMATE PERIMETER EMBANKMENT – PLAN
115	ULTIMATE MAIN EMBANKMENT – SECTION

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	JT		

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MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
ULTIMATE MAIN EMBANKMENT
PLAN

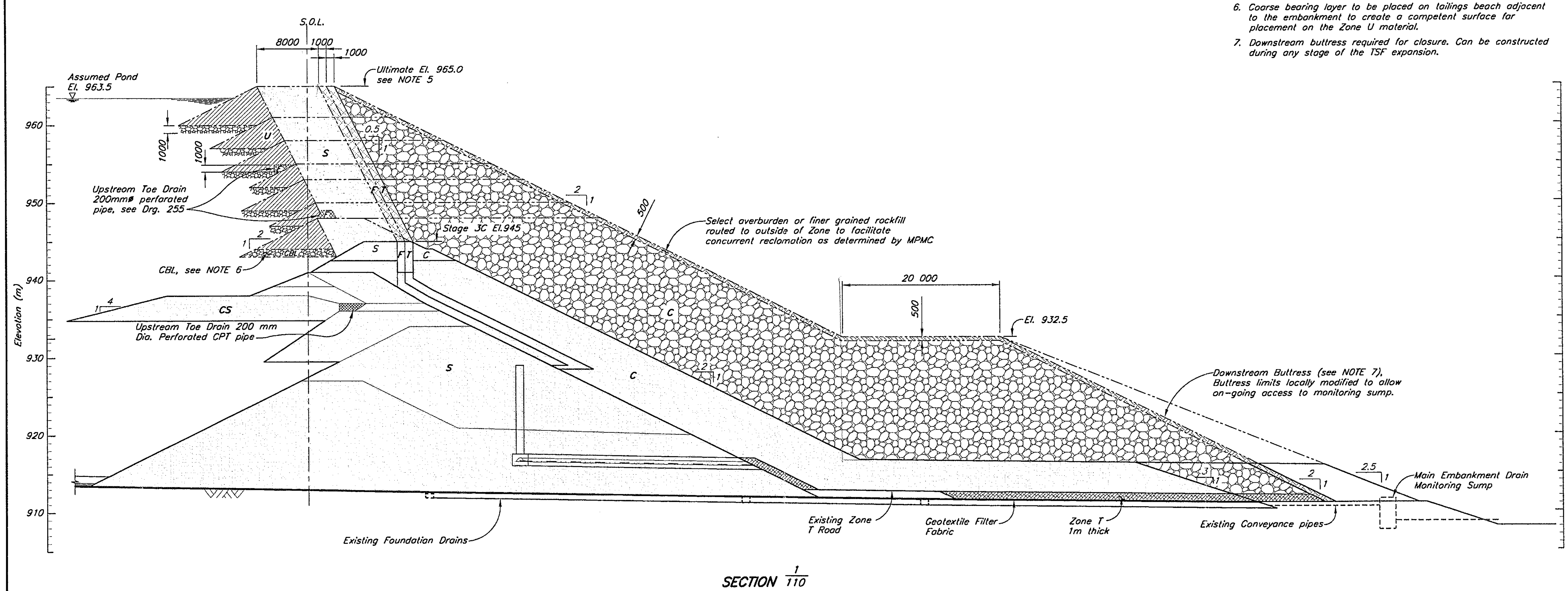
PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	110	0

XREF FILE : Topo2004_GA, Ultimate Plan

VANCOUVER\\... March 7, 2005

NOTES

1. *For zone material specifications and legend see Drg. 104.*
2. *All dimensions in millimetres and elevations in metres, unless noted otherwise.*
3. *Minimum lines and grades shown. Lines and grades may be extended upstream and downstream during Stage 4 construction.*
4. *Drawing is for reference only. IFC drawings will be issued for each stage construction.*
5. *Crest details to be revised to suit final reclamation objectives. A suitable wearing course, topsoil cover and revegetation are anticipated.*
6. *Coarse bearing layer to be placed on tailings beach adjacent to the embankment to create a competent surface for placement on the Zone U material.*
7. *Downstream buttress required for closure. Can be constructed during any stage of the TSF expansion.*



SECTION $\frac{1}{110}$

NOT FOR CONSTRUCTION

Scale 5 0 5 10 15 20 25 m

CAD FILE: M:\1\01\00001\08\A\Acad\Dwgs\115\115.dwg 1=250 PLOT 1=1(PS) March 8, 2005 bychambers

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MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
ULTIMATE MAIN EMBANKMENT
SECTION

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	115	0

REFERENCE DRAWINGS

DRG. NO.	DESCRIPTION
110	ULTIMATE MAIN EMBANKMENT – PLAN
104	ULTIMATE TAILINGS EMBANKMENT – MATERIAL SPECIFICATIONS

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
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XREF FILE :

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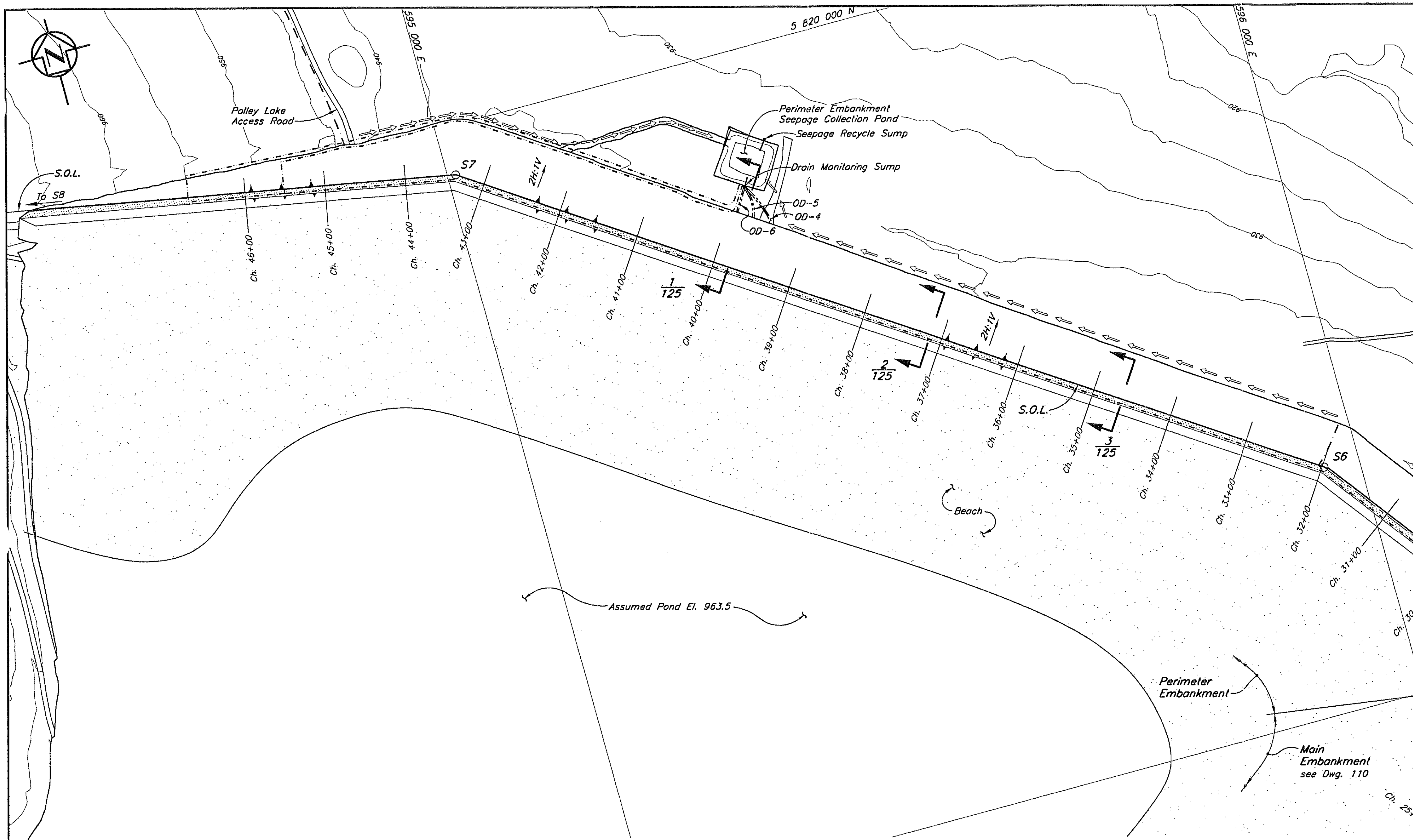

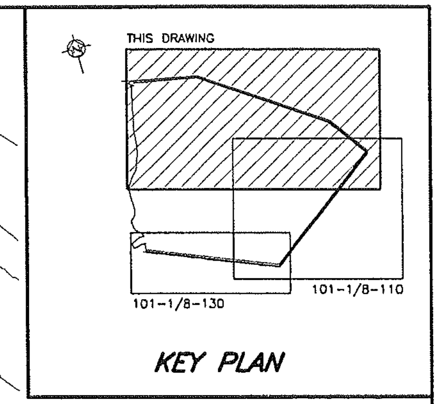

EMBANKMENT SETTING OUT POINTS			
Point	Northing	Easting	Chainage
S1	5 818 626.163	594 249.555	5+00.00
S4A	5 818 243.621	595 227.361	15+49.97
S4B	5 818 246.923	595 251.497	15+77.87
S4	5 818 238.539	595 240.350	15+63.92
S5A	5 818 951.971	596 188.906	27+50.83
S5B	5 818 986.958	596 193.873	28+00.78
S5	5 818 966.983	596 208.866	27+75.80
S6	5 819 304.035	595 955.881	31+97.23
S7	5 819 939.748	595 010.249	43+36.69
S8	5 820 053.034	594 396.471	49+60.83

NOTES

1. *Topography from 2004 Flyover.*
2. *All dimensions in millimetres and elevations in metres, unless noted otherwise.*
3. *Drawing is for reference only.*

NOT FOR CONSTRUCTION

Scale 50 0 50 100 150 200 250 m

DRG. NO.	DESCRIPTION
125	ULTIMATE PERIMETER EMBANKMENT - SECTIONS
110	ULTIMATE MAIN EMBANKMENT - PLAN

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
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MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
ULTIMATE PERIMETER EMBANKMENT
PLAN

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	120	0

XREF FILE : Topo2004_ _Plan

VANCOUVER B.C. CAD FILE: M:\1\01\00001\08\A\Acad\Dwgs\120\120 1:2500 Plot 1=1(PS) March 8, 2005 By: MAL

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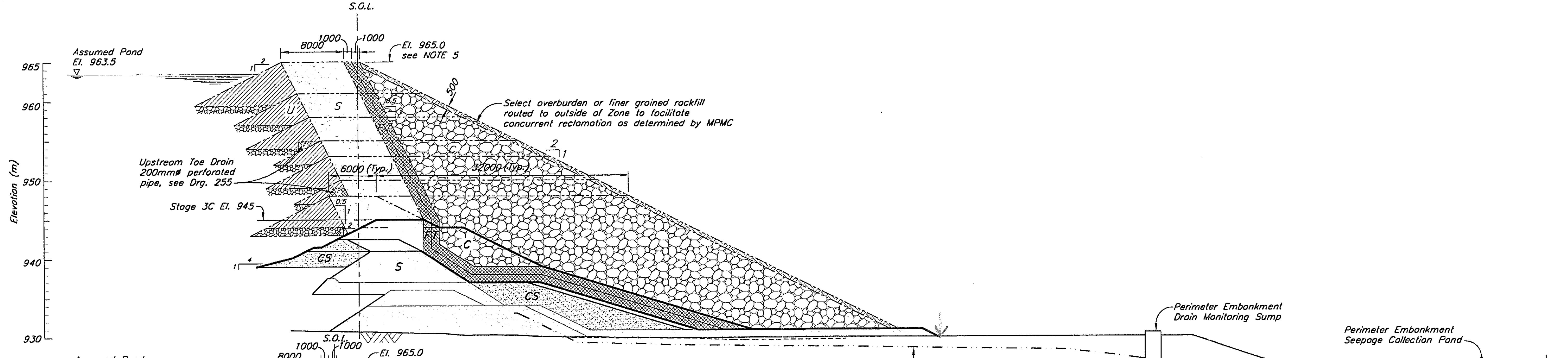
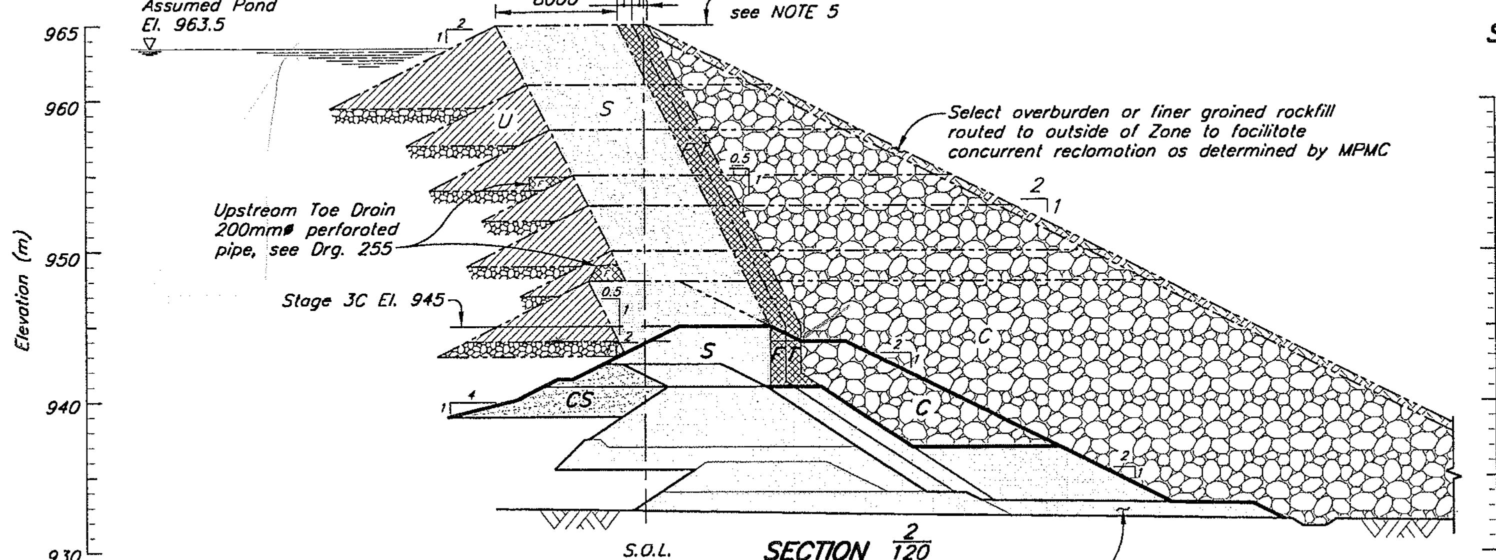
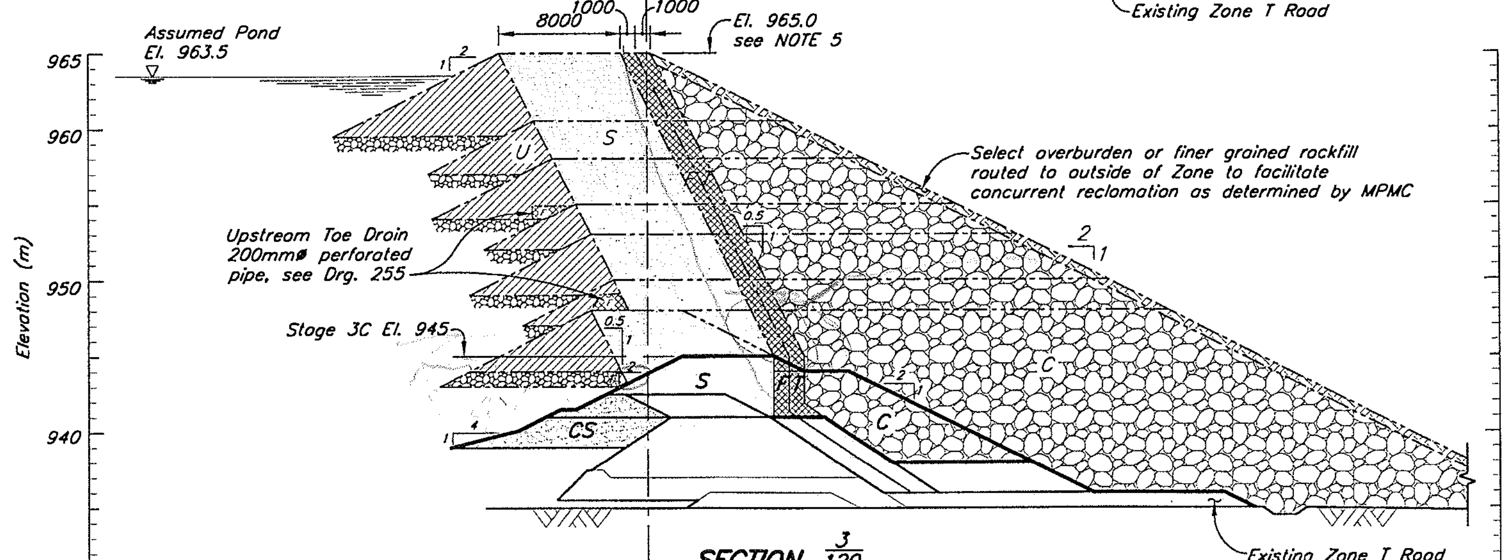


SECTION 1/120



SECTION 2/120



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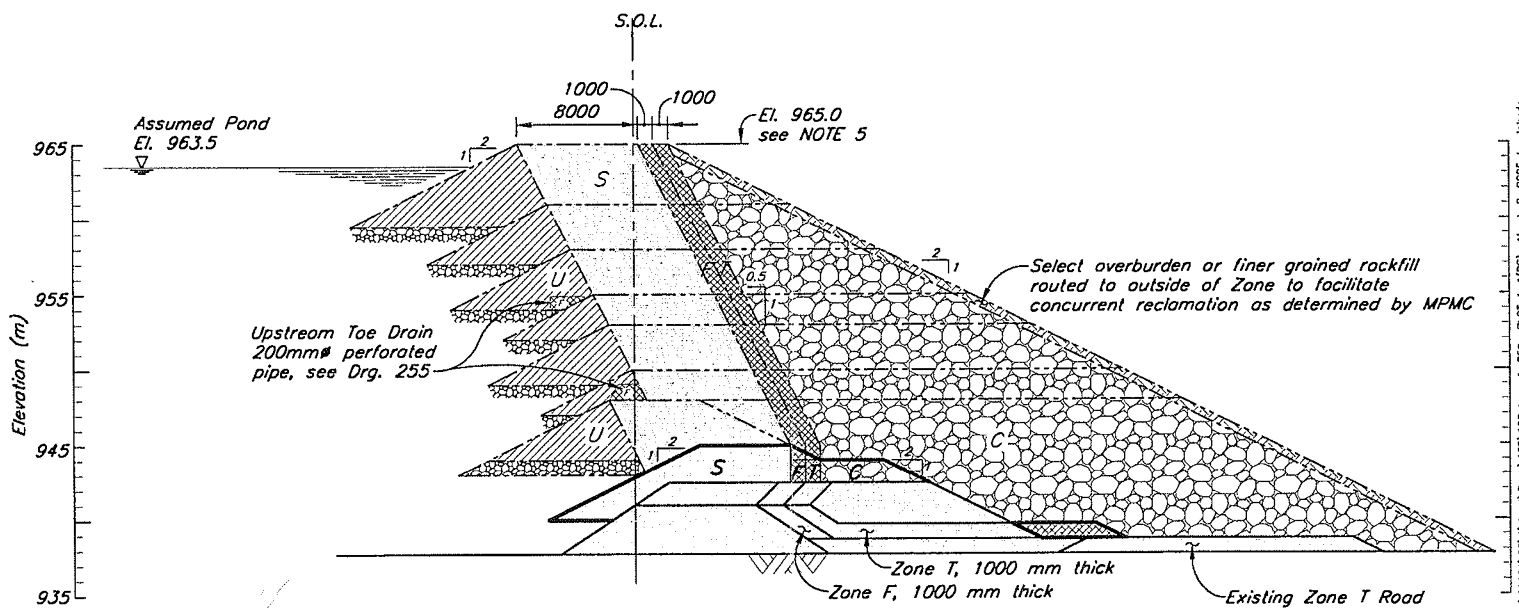

SECTION 4/120

NOTES

1. For zone material specifications and legend see Drg. 104.
2. All dimensions in millimetres and elevations in metres, unless noted otherwise.
3. Minimum lines and grades shown. Lines and grades may be extended upstream and downstream during Stage 4 construction.
4. Drawing is for reference only. IFC drawings will be issued for each Construction Stage.
5. Crest details to be revised to suit final reclamation objectives. A suitable wearing course, topsoil cover and revegetation are anticipated.
6. Coarse bearing layer to be placed on tailings beach adjacent to the embankment to create a competent surface for placement on the Zone U material.

NOT FOR CONSTRUCTION

Scale 5 0 5 10 15 20 25 m

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MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
ULTIMATE PERIMETER EMBANKMENT
SECTIONS

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	125	0

DRG. NO.	DESCRIPTION
120	ULTIMATE PERIMETER EMBANKMENT - PLAN
104	ULTIMATE TAILINGS EMBANKMENT - MATERIAL SPECIFICATIONS

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	JT		

REVISIONS

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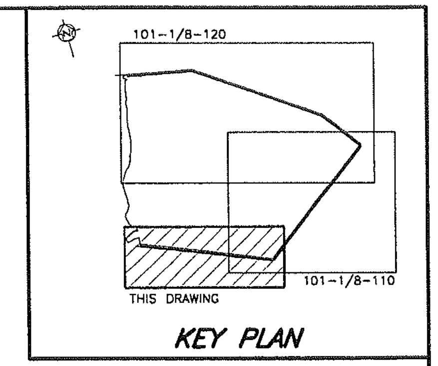
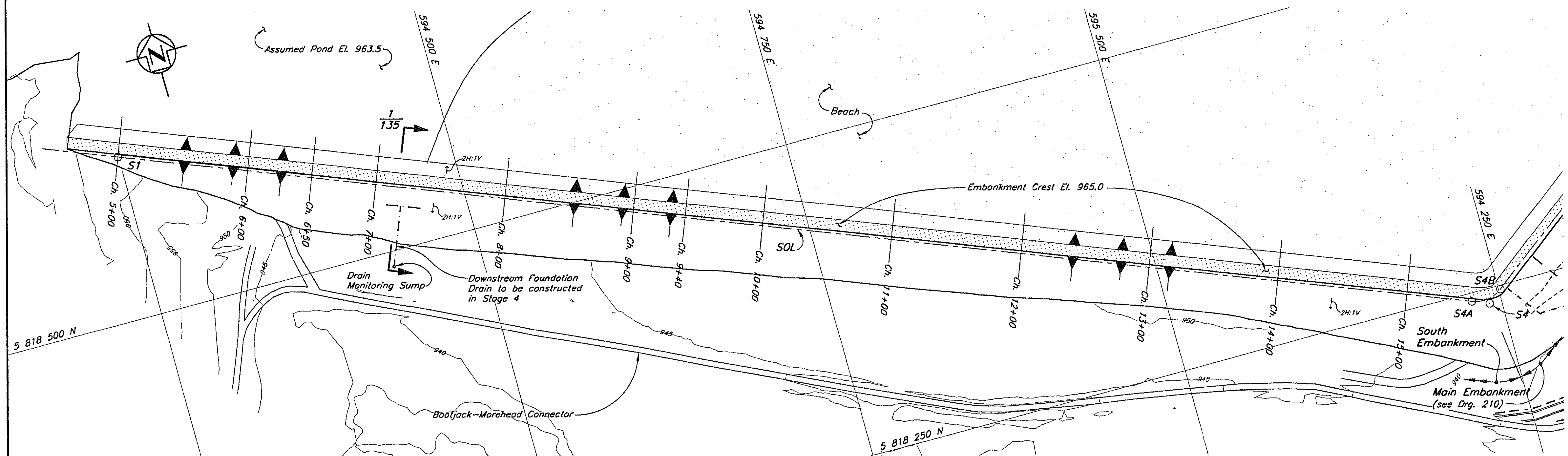




NOT FOR CONSTRUCTION

Scale 30 0 30 60 90 120 150 m

NOTES

1. Topography from 2004 Flyover.
2. All dimensions in millimetres and elevations in metres, unless noted otherwise.
3. Drawing is for reference only.

DRG. NO.	DESCRIPTION
135	ULTIMATE SOUTH EMBANKMENT – SECTION
120	ULTIMATE PERIMETER EMBANKMENT – PLAN
110	ULTIMATE MAIN EMBANKMENT – PLAN
104	ULTIMATE TAILINGS EMBANKMENT – MATERIAL SPECIFICATIONS

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	JT	[signature]	KJB

REVISIONS

PROFESSIONAL ENGINEER – PROVINCE OF BRITISH COLUMBIA – L.J. GALBRAITH 25493

Knight Piésold CONSULTING

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
ULTIMATE SOUTH EMBANKMENT
PLAN

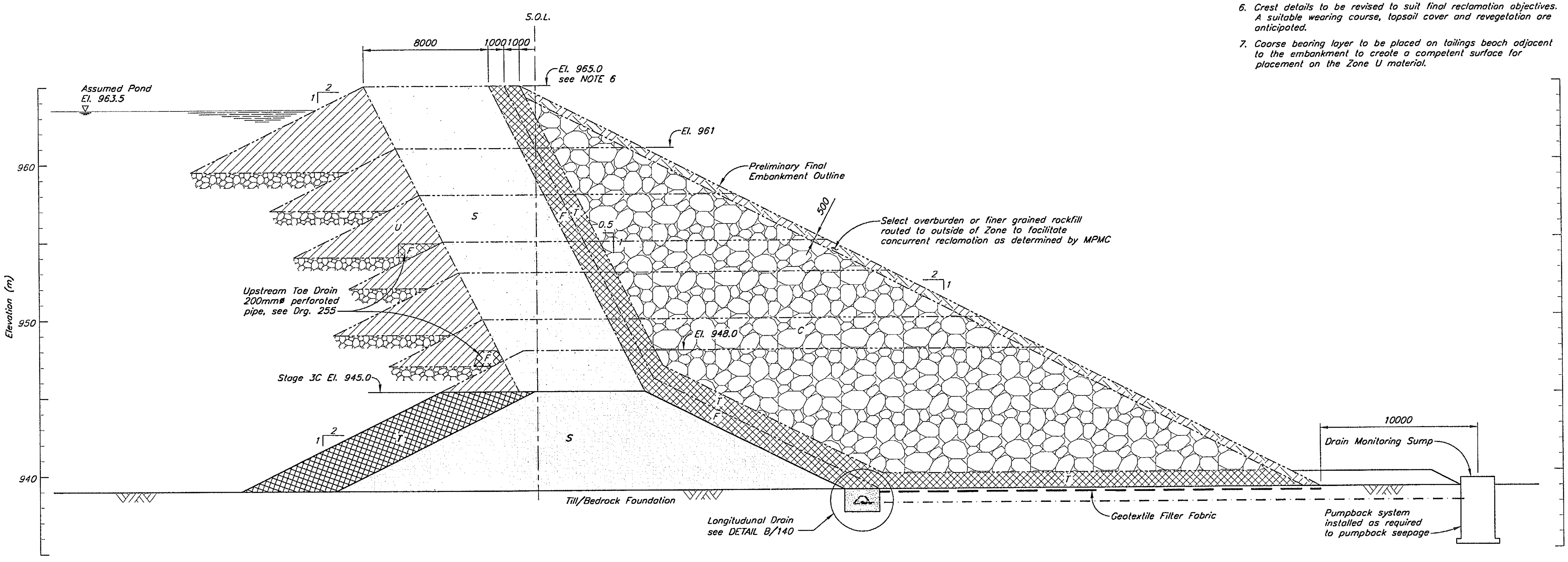
PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	130	0

XREF FILE : Topo2004_CA, Ultimate_Plan

VANCOUVER B.C. CAD FILE: M:\1\01\00001\08\A\Acad\Dwgs\130\130 1=1500 Plot 1=1(PS) Feb.18, 2005 By:WAL

NOTES

1. For zone material specifications and legend see Drg. 104
2. All dimensions in millimetres and elevations in metres, unless noted otherwise.
3. Minimum lines and grades shown. Lines and grades may be extended upstream and downstream during Stage 4 construction.
4. Outlet drain/downstream foundation drain to be constructed in Stage 4
5. Drawing is for reference only. IFC drawings will be issued for each stage construction.
6. Crest details to be revised to suit final reclamation objectives. A suitable wearing course, topsoil cover and revegetation are anticipated.
7. Coarse bearing layer to be placed on tailings beach adjacent to the embankment to create a competent surface for placement on the Zone U material.



SECTION 1/130

NOT FOR CONSTRUCTION

Scale 2 0 2 4 6 8 10 m

DRG. NO.	DESCRIPTION
130	ULTIMATE SOUTH EMBANKMENT – PLAN
104	ULTIMATE TAILINGS EMBANKMENT – MATERIAL SPECIFICATIONS

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	JT		KJB

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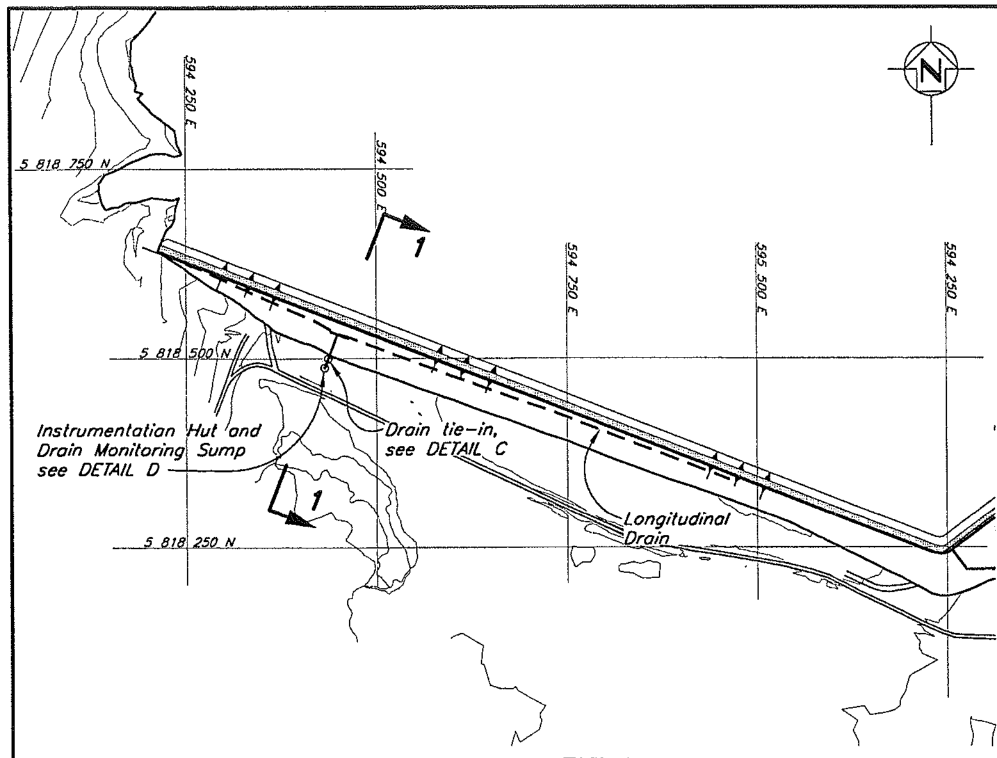
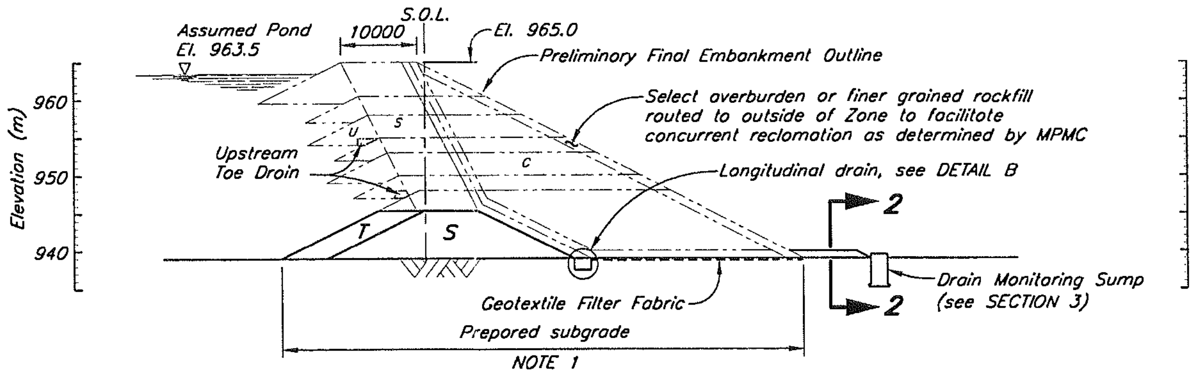
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
ULTIMATE SOUTH EMBANKMENT
SECTION

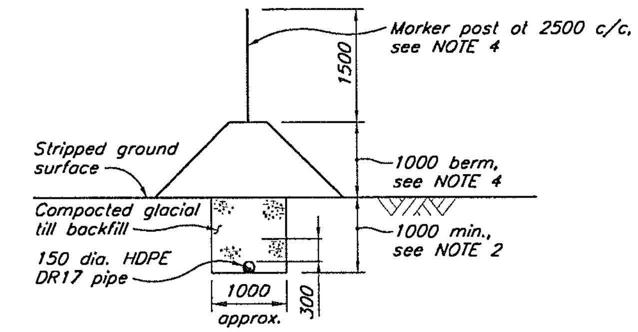
PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	135	0



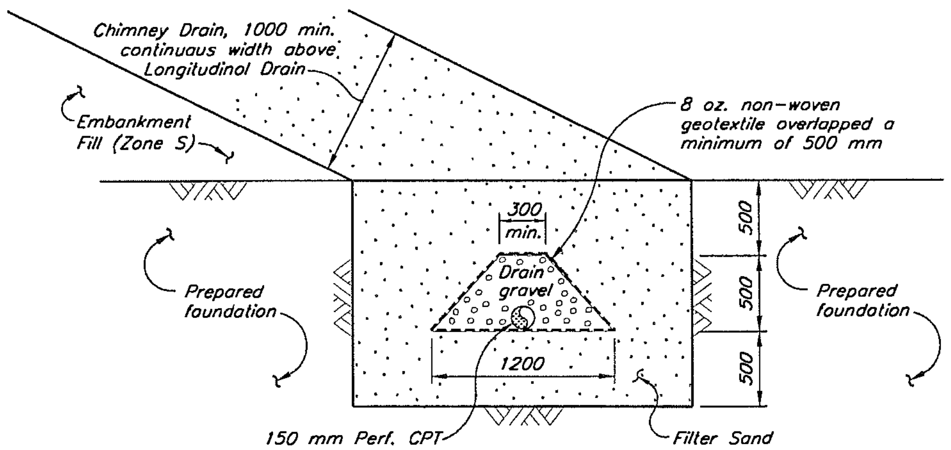
SOUTH EMBANKMENT PLAN
Scale A



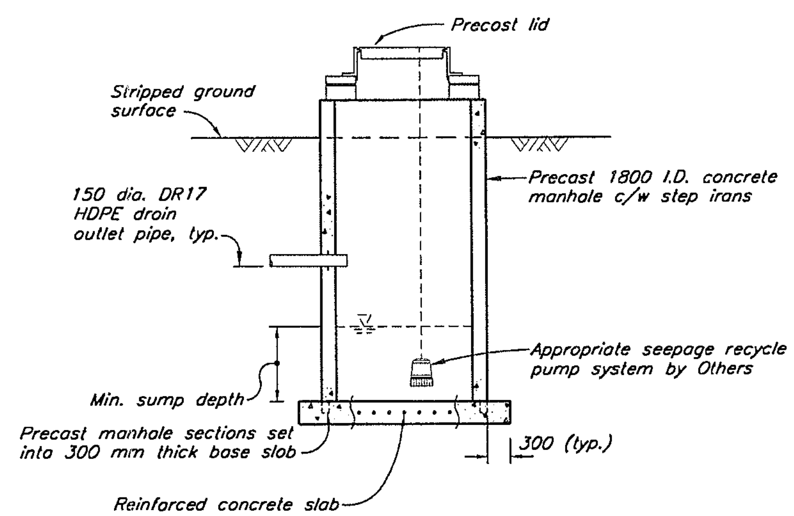
SECTION 1
Scale B



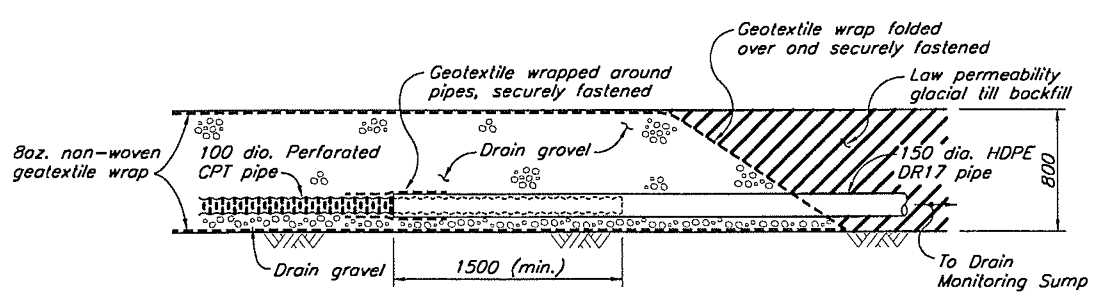
SECTION 2
Scale D



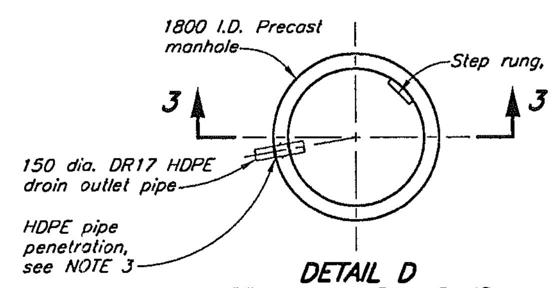
DETAIL B , B/135
LONGITUDINAL DRAIN
Scale C



SECTION 3
Scale D



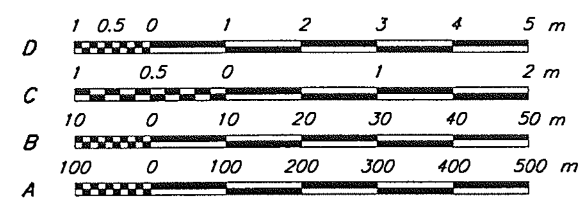
DETAIL C
EMBANKMENT FOUNDATION DRAIN TIE-IN (IN SECTION)
Scale C



DETAIL D
DRAIN MONITORING SUMP
Scale D

NOTES

1. Subgrade preparation to comprise stripping of topsoil and organics and removing saturated materials to establish a competent, bearing surface for fill placement as directed by the Engineer.
2. All pipework to have a minimum of 1 m of cover for frost protection.
3. All HDPE pipe penetrations to be water tight.
4. Buried pipework to be covered by a berm and clearly marked by a line of stakes.
5. Drain Monitoring Sump is conceptual only. Details to be provided in the Stage 4 design of the TSF.



NOT FOR CONSTRUCTION

DRG. NO.	DESCRIPTION
135	ULTIMATE SOUTH EMBANKMENT - SECTION
130	ULTIMATE SOUTH EMBANKMENT - PLAN

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	ND		

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Knight Piésold CONSULTING

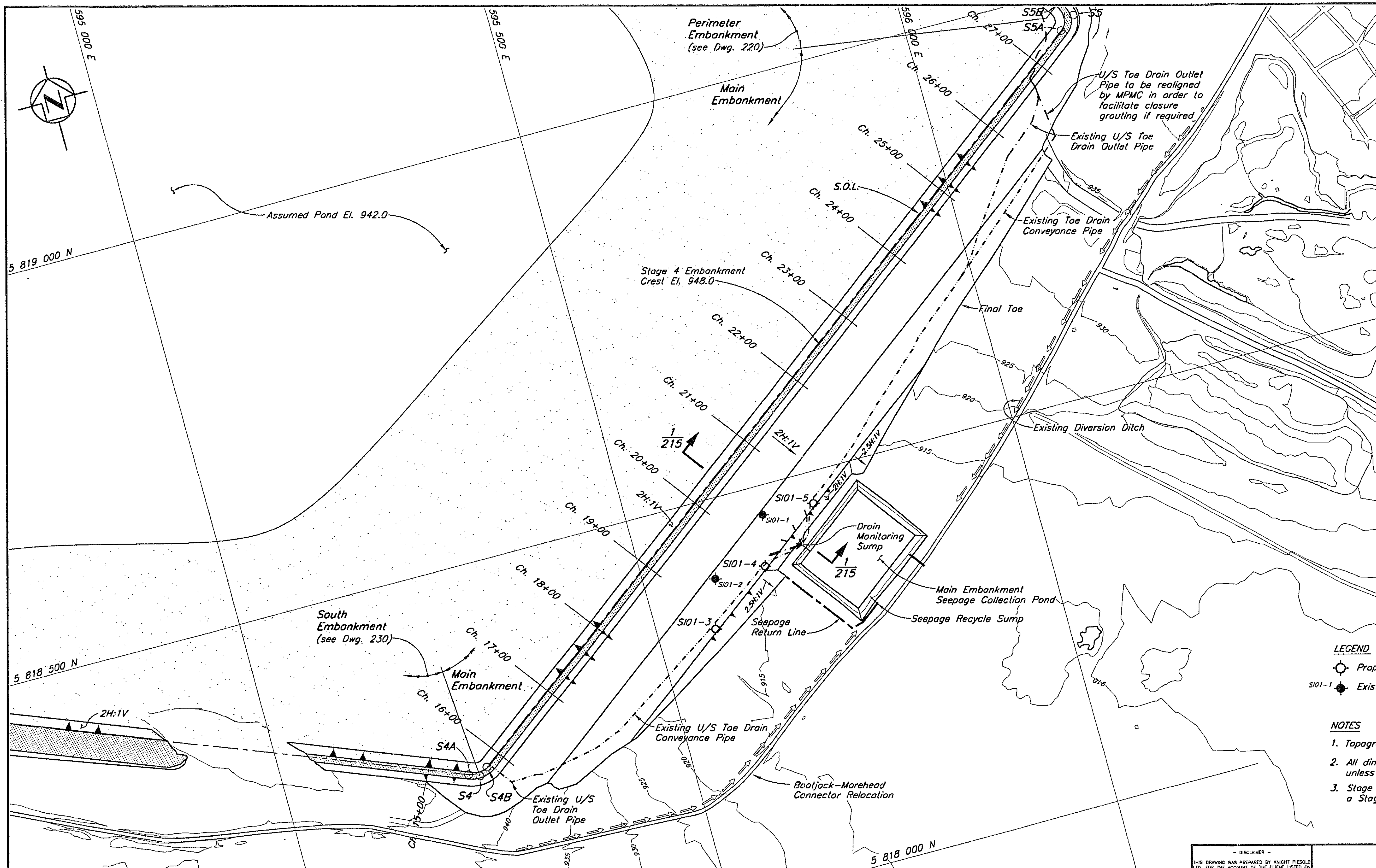
MOUNT POLLEY MINING CORPORATION

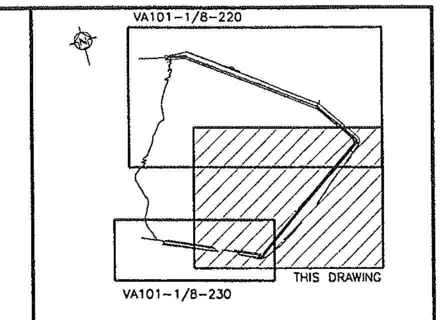
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
SOUTH EMBANKMENT
LONGITUDINAL AND FOUNDATION DRAIN
SECTIONS AND DETAILS

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	140	0

AMEC010450_0053





KEY PLAN

LEGEND

Proposed Inclinometer

SI01-1 Existing Inclinometer

NOTES

1. Topography from 2004 flyover
2. All dimensions in millimetres and elevations in metres, unless noted otherwise.
3. Stage 4 construction dimensions and volumes assume a Stage 3C crest elevation of El. 945m.

NOT FOR CONSTRUCTION

Scale 50 0 50 100 150 200 250 Metres

DRG. NO.	DESCRIPTION
230	STAGE 4 SOUTH EMBANKMENT – PLAN
220	STAGE 4 PERIMETER EMBANKMENT – PLAN
215	STAGE 4 MAIN EMBANKMENT – SECTIONS AND DETAILS

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	JT		

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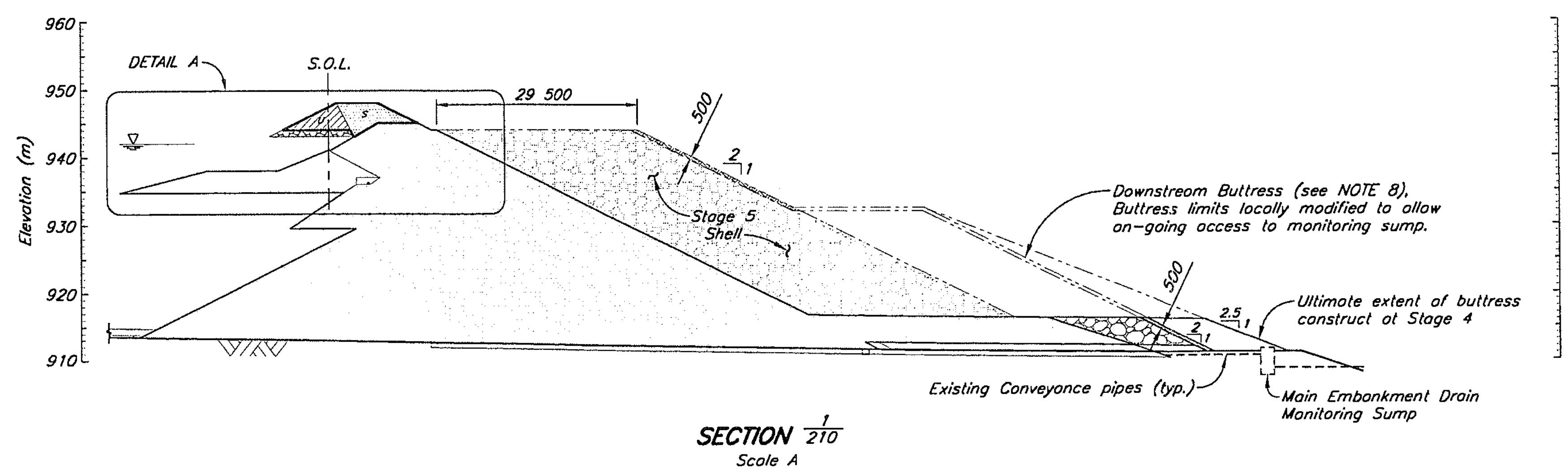
TAILINGS STORAGE FACILITY
STAGE 4 MAIN EMBANKMENT
PLAN

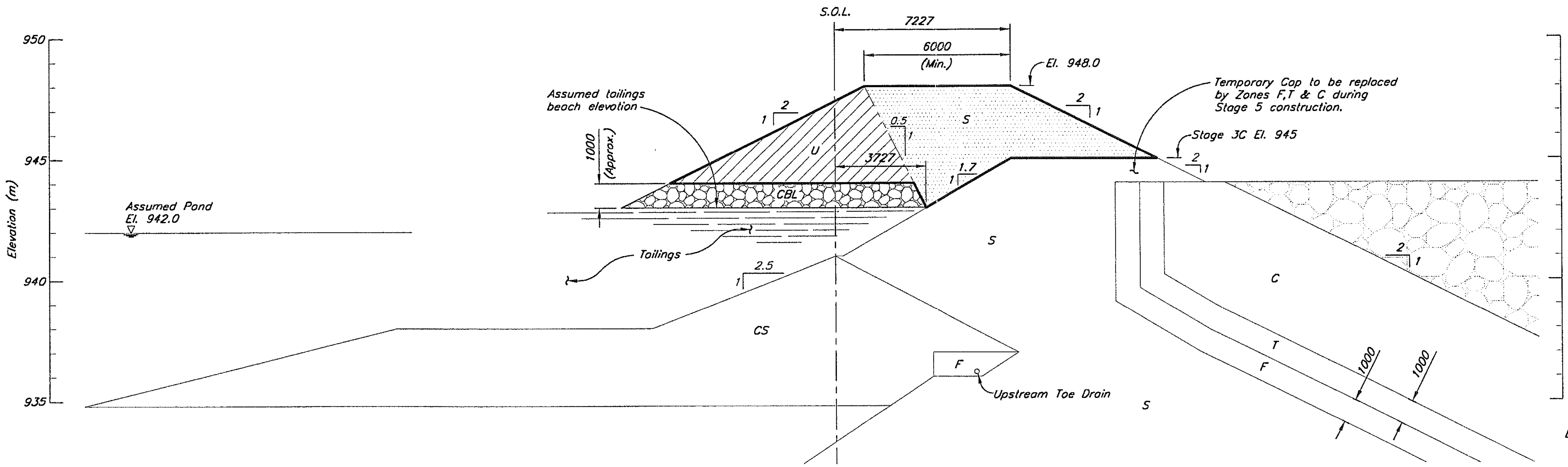
PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	210	0

XREF FILE : Topo2004_GA, Stage4_Plan

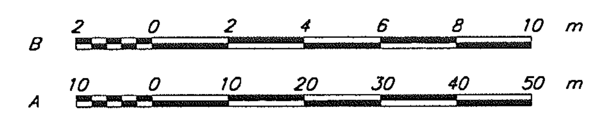
VANCOUVER B.C. CAD FILE: M:\1\01\00001\08\A\Acad\Dwgs\210\210.dwg 1=2500 PLOT 1=1(PS) March 8, 2005 by:abdo



SECTION $\frac{1}{210}$
Scale A



DETAIL A
Scale B



NOTES

1. For zone material specifications and legend see Drg. 104.
2. All dimensions in millimetres and elevations in metres, unless noted otherwise.
3. Zone S to be placed to minimum 6 m width at El. 948 Zone F and Zone T to be extended in future construction programs.
4. Minimum lines and grades shown. Lines and grades may be extended upstream and downstream during Stage 4 construction.
5. Stage 4 construction dimensions and volumes assume a Stage 3C crest elevation of El. 945m.
6. Stage 5 Shell to be constructed during 2005-2006
7. Stage 5 Zone C Shell to be raised concurrently with Zone F and Zone T extension.
8. Downstream buttress required for closure. Can be constructed during any stage of the TSF expansion.

NOT FOR CONSTRUCTION

VANCOUVER B.C. CAD FILE: M:\1\01\00001\08\A\Acad\Dwgs\215\215.dwg 1=500 PLOT 1=1(PS) March 8 2005 by:wlahoda

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MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 4 MAIN EMBANKMENT
SECTIONS AND DETAILS

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	215	0

REFERENCE DRAWINGS

DRG. NO.	DESCRIPTION
210	STAGE 4 MAIN EMBANKMENT - PLAN
104	ULTIMATE TAILINGS EMBANKMENT - MATERIAL SPECIFICATIONS

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	JT		

XREF FILE :

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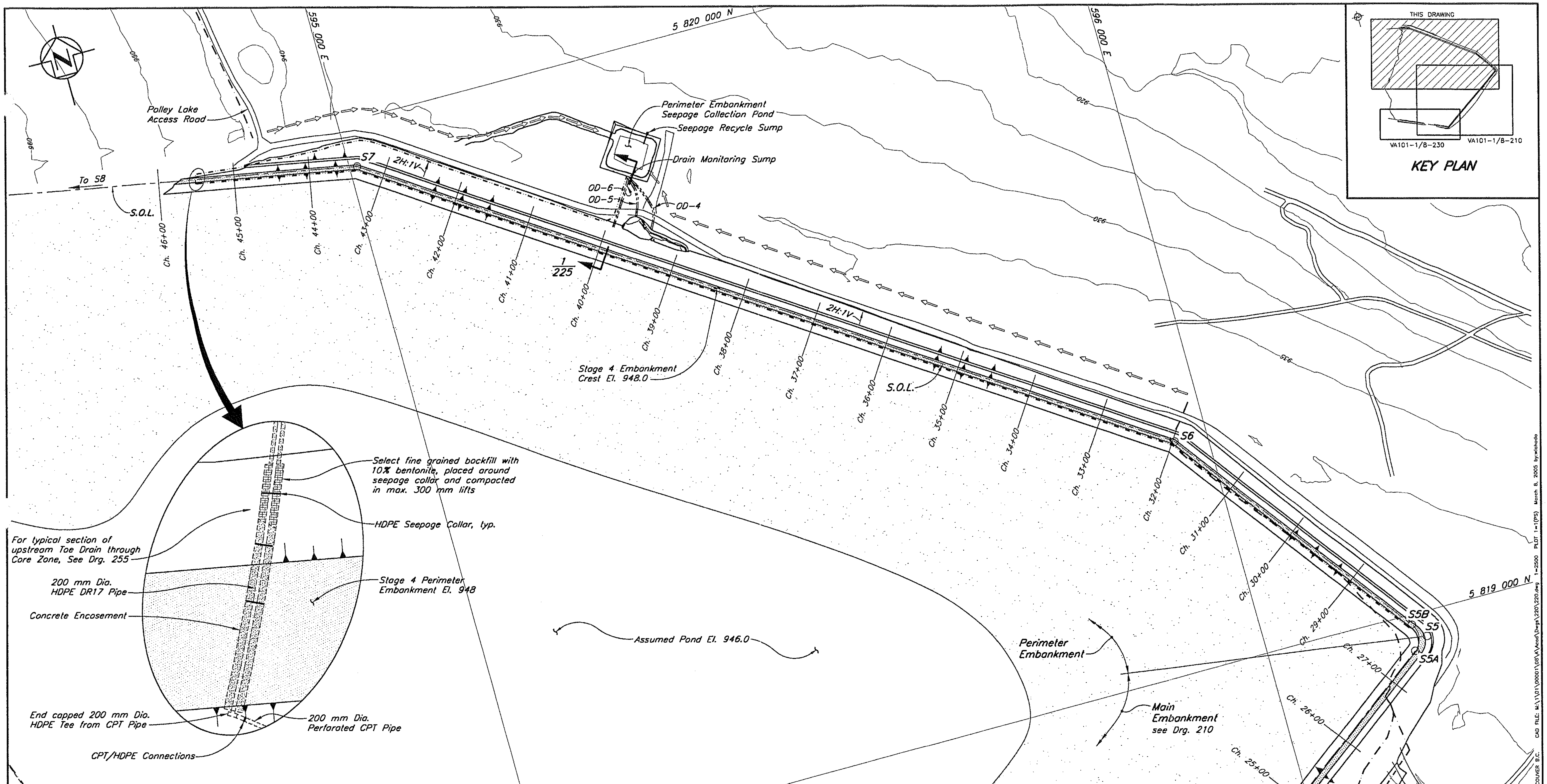

EMBANKMENT SETTING OUT POINTS			
Point	Northing	Easting	Chainage
S1	5 818 626.163	594 249.555	5+00.00
S4A	5 818 243.621	595 227.361	15+49.97
S4B	5 818 246.923	595 251.497	15+77.87
S4	5 818 238.539	595 240.350	15+63.92
S5A	5 818 951.971	596 188.906	27+50.83
S5B	5 818 986.958	596 193.873	28+00.78
S5	5 818 966.983	596 208.866	27+75.80
S6	5 819 304.035	595 955.881	31+97.23
S7	5 819 939.748	595 010.249	43+36.69
S8	5 820 053.034	594 396.471	49+60.83

NOTES

1. Topography from 2004 flyover.
2. All dimensions in millimetres and elevations in metres, unless noted otherwise.
3. Stage 4 construction dimensions and volumes assume o Stage 3C crest elevation of El. 945m.
4. Upstream toe drain pipe to be realigned by MPMC in order to facilitate closure grouting if required.

NOT FOR CONSTRUCTION

Scale 50 0 50 100 150 200 250 m

DRG. NO.	DESCRIPTION
230	STAGE 4 SOUTH EMBANKMENT - PLAN
225	STAGE 4 PERIMETER EMBANKMENT - SECTIONS
210	STAGE 4 MAIN EMBANKMENT - PLAN

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	JT		

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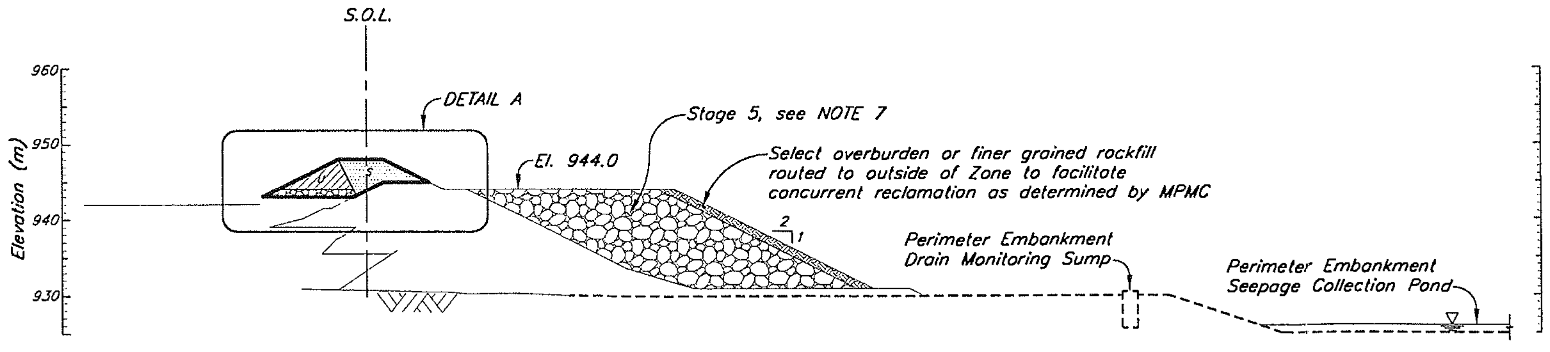
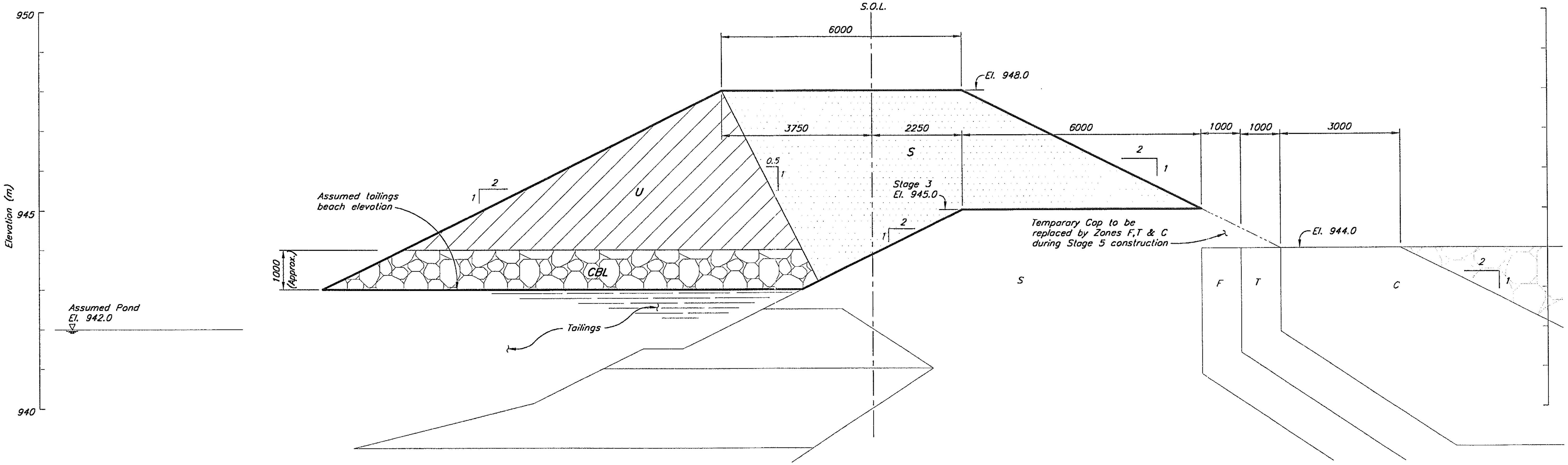
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 4 PERIMETER EMBANKMENT
PLAN

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	220	0



SECTION $\frac{1}{220}$
Scale A



DETAIL A
Scale B

NOTES
1. For zone material specifications and legend see Drg. 104.
2. All dimensions in millimetres and elevations in metres, unless noted otherwise.
3. Zone S to be placed to minimum 6 m width at El. 945. Zone F and Zone T to be extended in future construction programs.
4. Minimum lines and grades shown. Lines and grades may be extended upstream and downstream during Stage 4 construction.
5. Stage 4 construction dimensions and volumes assume a Stage 3C crest elevation of EL 945.0m.
6. Stage 5 Shell to be constructed during 2005–2006
7. Stage 5 Zone C Shell to be raised concurrently with Zone F and Zone T extension.

B 1 0 1 2 4 6 8 m

A 10 0 10 20 30 40 50 m

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MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 4 PERIMETER EMBANKMENT
SECTIONS

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	225	0

DRG. NO.	DESCRIPTION
120	STAGE 4 – PERIMETER EMBANKMENT – PLAN
104	STAGE 4 – MATERIAL SPECIFICATIONS

REFERENCE DRAWINGS

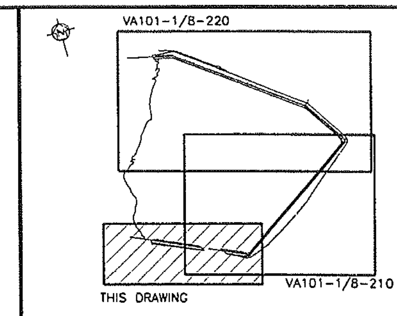
REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	JT	[signature]	KJS

REVISIONS

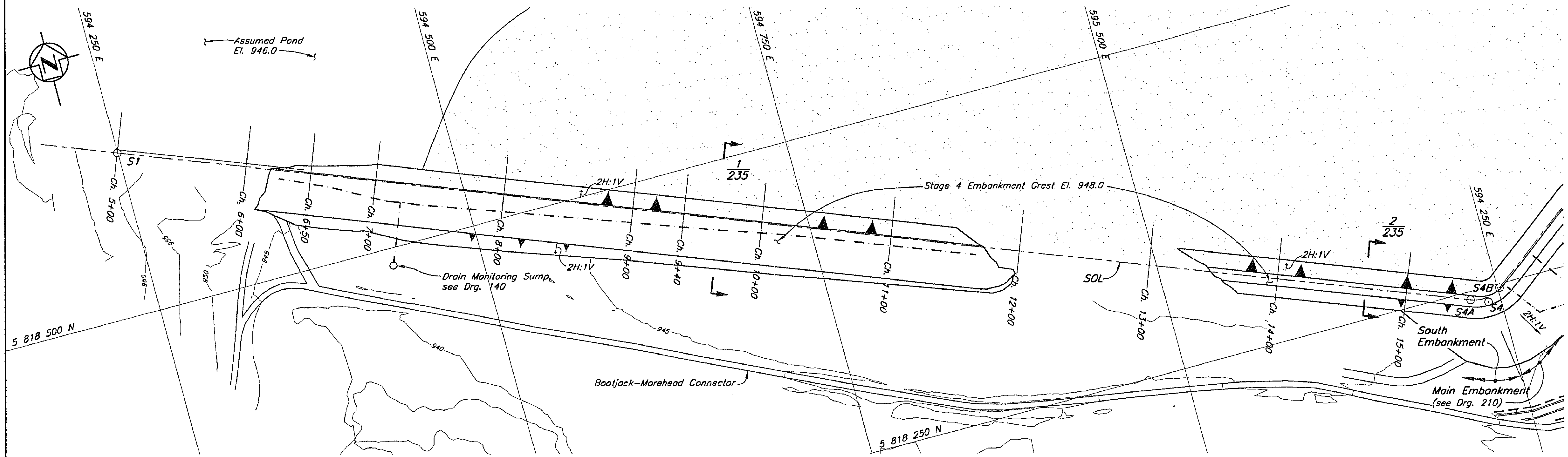
VANCOUVER B.C. CAD FILE: M:\1\01\00001\08\A\Acad\Dwgs\225\225 1=250 Plot 1=(PS) Feb 25, 2005 ByWAL

XREF FILE :

AMEC010450_0057



KEY PLAN



PLAN

NOT FOR CONSTRUCTION

Scale 30 0 30 60 90 120 150 m

NOTES

1. Topography from 2004 flyover.
2. All dimensions in millimetres and elevations in metres, unless noted otherwise.
3. Stage 4 construction dimensions and volumes assume a Stage 3C crest elevation of El. 945m.
4. Foundation drains need to be installed during Stage 4, before the downstream rockfill is placed.

DRG. NO.	DESCRIPTION
235	STAGE 4 SOUTH EMBANKMENT – SECTIONS
220	STAGE 4 PERIMETER EMBANKMENT – PLAN
210	STAGE 4 MAIN EMBANKMENT – PLAN
104	ULTIMATE TAILINGS EMBANKMENT – MATERIAL SPECIFICATIONS

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	JT		

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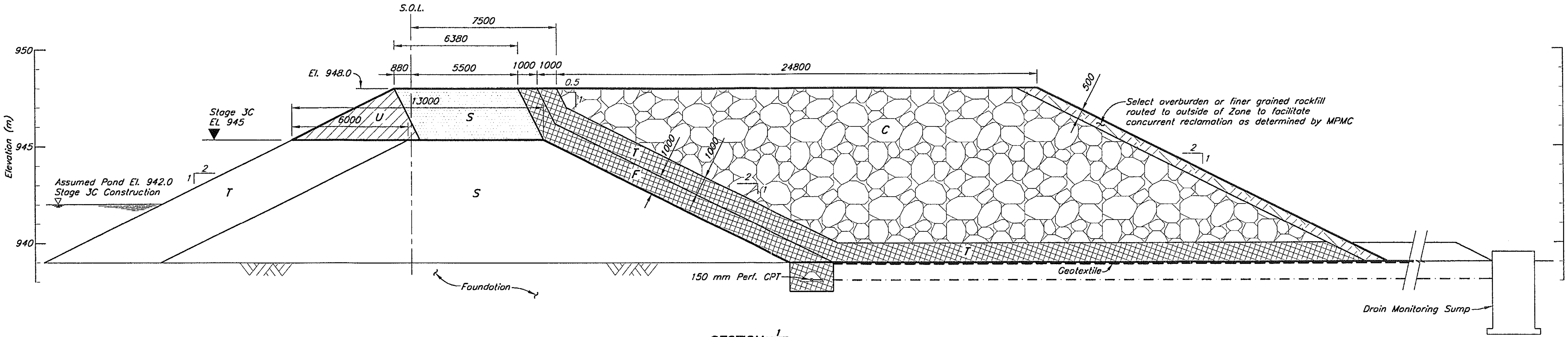
MOUNT POLLEY MINE

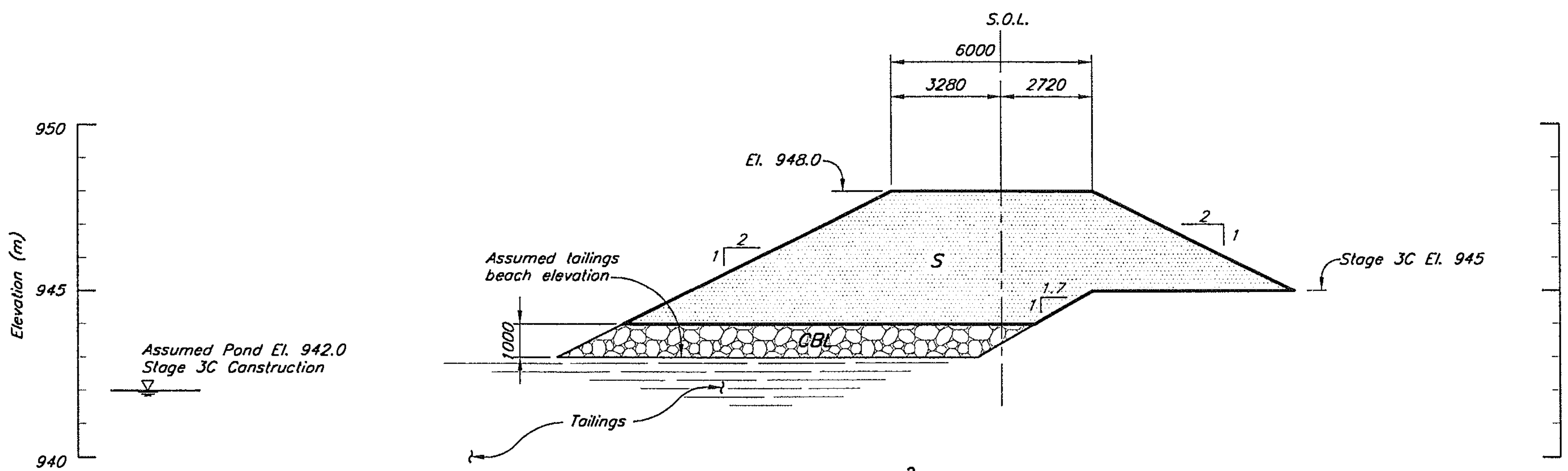
TAILINGS STORAGE FACILITY
STAGE 4 SOUTH EMBANKMENT
PLAN

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	230	0

XREF FILE : Topo2004_CA, Stage4_Plan



SECTION $\frac{1}{230}$



SECTION $\frac{2}{230}$

NOTES

1. For zone material specifications and legend see Drg. 104.
2. All dimensions in millimetres and elevations in metres, unless noted otherwise.
3. Zone S to be placed to minimum 6 m width at El. 948 Zone F and Zone T to be extended in future construction programs.
4. Minimum lines and grades shown. Lines and grades may be extended upstream and downstream during Stage 4 construction.
5. Stage 4 construction dimensions and volumes assume a Stage 3C crest elevation of El. 945m.
6. Stage 5 Shell to be constructed during 2005–2006.
7. Stage 5 Zone C Shell to be raised concurrently with Zone F and Zone T extension.

NOT FOR CONSTRUCTION

Scale 2 0 2 4 6 8 10 m

VANCOUVER B.C. CAD FILE: M:\1\01\00001\08\A\Acad\Dwgs\235\235 1=100 Plot 1=1(PS) Feb. 25, 2005 By:WAL

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MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 4 SOUTH EMBANKMENT
SECTIONS

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	235	0

REFERENCE DRAWINGS

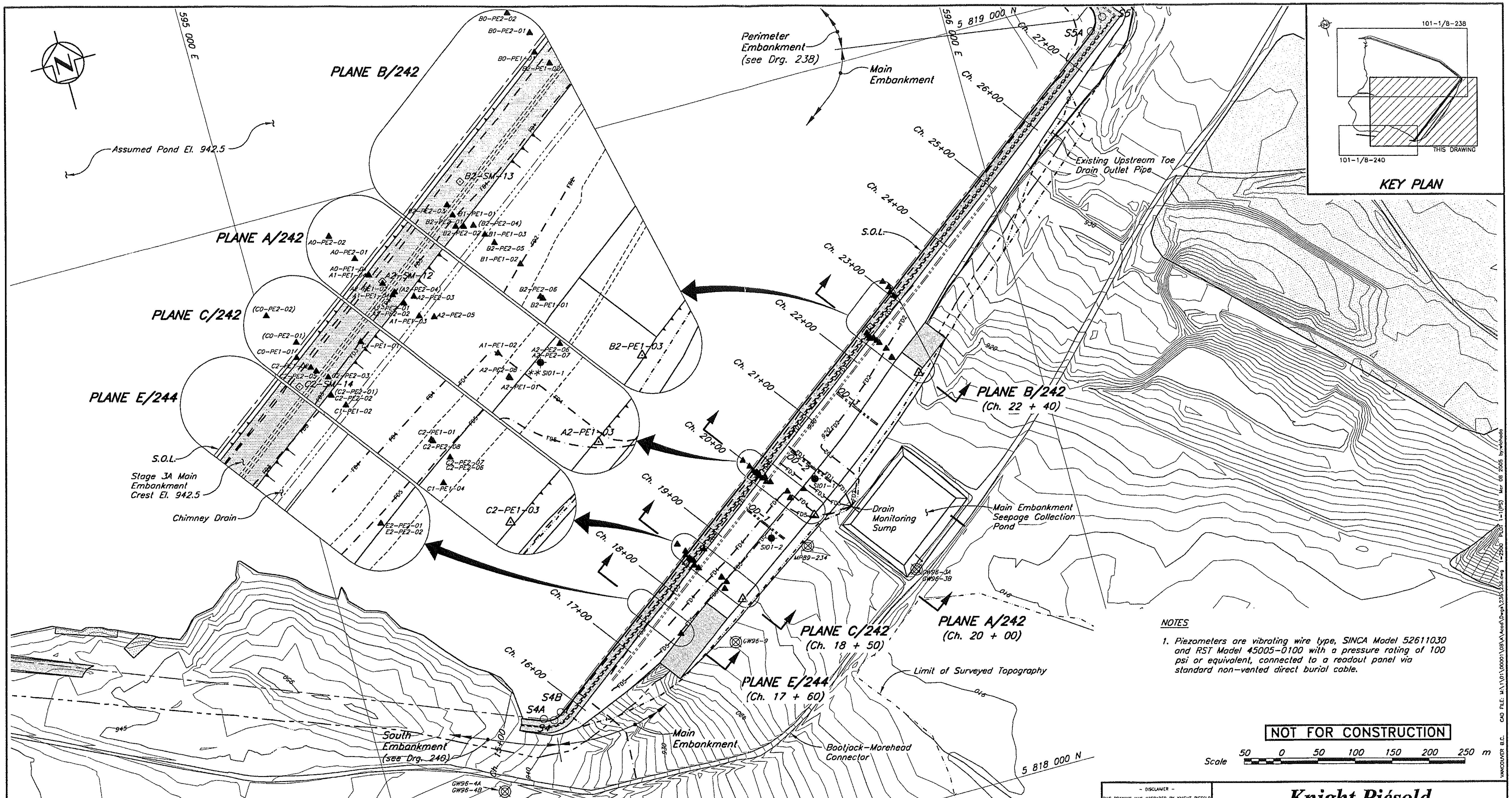
DRG. NO.	DESCRIPTION
230	STAGE 4 SOUTH EMBANKMENT - PLAN
104	ULTIMATE TAILINGS EMBANKMENT - MATERIAL SPECIFICATIONS

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	JT		

XREF FILE:

AMEC010450_0059



NOTES

1. Piezometers are vibrating wire type, SINCA Model 52611030 and RST Model 45005-0100 with a pressure rating of 100 psi or equivalent, connected to a readout panel via standard non-vented direct burial cable.

NOT FOR CONSTRUCTION

Scale 50 0 50 100 150 200 250 m

LEGEND

- GW96-9 Groundwater Monitoring Well
- A1-PE1-01 Previously installed Piezometer
- A2-PE2-06 New Stage 3 Piezometer
- A2-SM-01 New Embankment Survey Monument
- SI01-1 Existing Inclinometer

DRG. NO.	DESCRIPTION
244	EXISTING INSTRUMENTATION – PLANES D E, F, G AND H
242	EXISTING INSTRUMENTATION – PLANES A, B AND C
240	EXISTING INSTRUMENTATION – SOUTH EMBANKMENT – PLAN
238	EXISTING INSTRUMENTATION – PERIMETER EMBANKMENT – PLAN

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	WAL		

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PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — L.J. GALBRAITH 25493

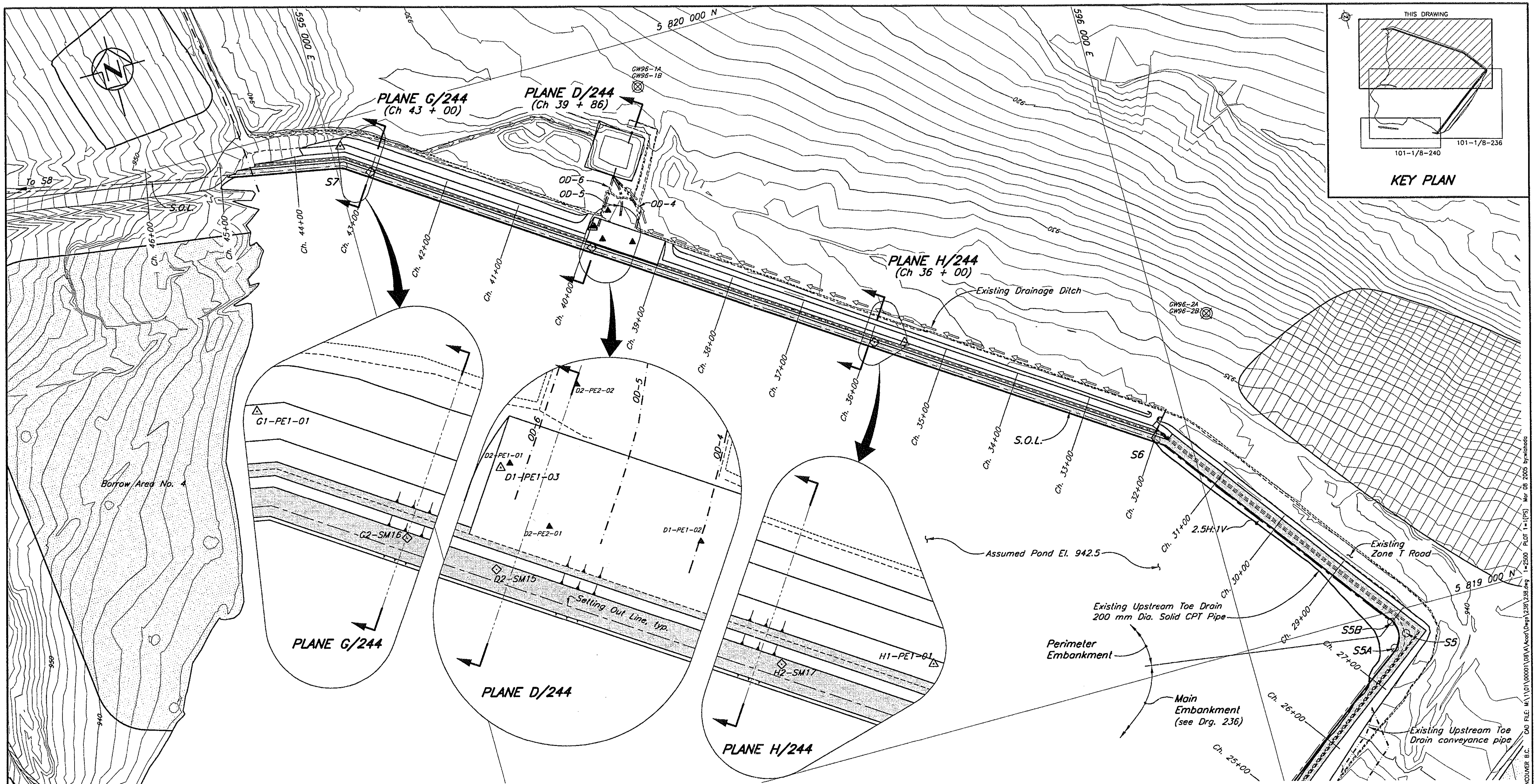
Knight Piésold CONSULTING

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
EXISTING INSTRUMENTATION
MAIN EMBANKMENT
PLAN

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	236	0



LEGEND

- ⊗ GW96-9 Groundwater Monitoring Well
- ▲ A1-PE1-01 Previously installed Piezometer
- △ A2-PE2-06 New Stage 3 Piezometer
- ◇ A2-SM-01 New Embankment Survey Monument

NOTES

1. Chainage defined by Setting Out Point S1 at Ch. 5+00.
2. Topography generated from points and break lines provided by MPMC on July 20, 1999. Topography outside the TSF area is from 1997 flyover.
3. Piezometers are vibrating wire type, SINCA Model 52611030 and RST Model 45005-0100 with a pressure rating of 100 psi or equivalent, connected to a readout panel via standard non-vented direct burial cable.

NOT FOR CONSTRUCTION

Scale 50 0 50 100 150 200 250 m

DRG. NO.	DESCRIPTION
244	EXISTING INSTRUMENTATION – PLANES D, E, F, G AND H
242	EXISTING INSTRUMENTATION – PLANES A, B AND C
240	EXISTING INSTRUMENTATION – SOUTH EMBANKMENT – PLAN
236	EXISTING INSTRUMENTATION – MAIN EMBANKMENT – PLAN

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	WAL	[signature]	KJB

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Knight Piésold CONSULTING

MOUNT POLLEY MINING CORPORATION

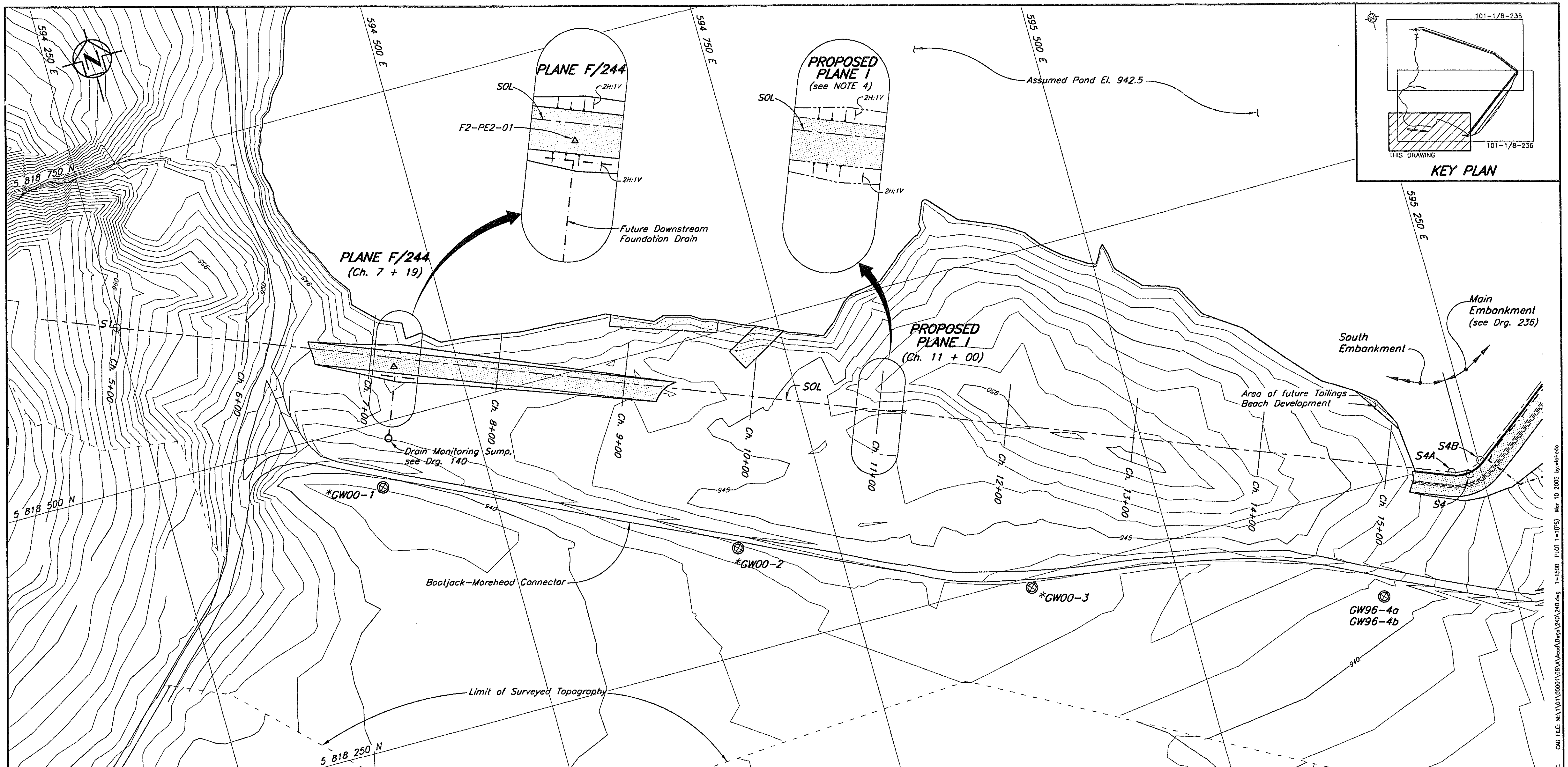
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
EXISTING INSTRUMENTATION
PERIMETER EMBANKMENT
PLAN

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	238	0

VANCOUVER B.C.

XREF FILE : Topo99



LEGEND

- GW96-9 Groundwater Monitoring Well
- ▲ A1-PE1-01 Previously installed Piezometer
- △ A2-PE2-06 New Stage 3 Piezometer
- ◇ A2-SM-01 New Embankment Survey Monument

NOTES

1. All dimensions in millimetres with elevations in metres, unless noted otherwise.
2. No work was completed at the South Embankment during Stage 3B construction.
3. Piezometers are vibrating wire type, SINCA Model 52611030 and RST Model 45005-0100 with a pressure rating of 100 psi or equivalent, connnected to a readout panel via standard non-vented direct burial cable.
4. Proposed Plane I Instrumentotion will be installed in Stage 5.

NOT FOR CONSTRUCTION

Scale 30 0 30 60 90 120 150 m

DRG. NO.	DESCRIPTION
244	EXISTING INSTRUMENTATION - PLANES D, E, F, G AND H
242	EXISTING INSTRUMENTATION - PLANES A, B AND C
238	EXISTING INSTRUMENTATION - PERIMETER EMBANKMENT - PLAN
236	EXISTING INSTRUMENTATION - MAIN EMBANKMENT - PLAN

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	WAL		KJS

REVISIONS

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TAILINGS STORAGE FACILITY
EXISTING INSTRUMENTATION
SOUTH EMBANKMENT
PLAN

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	240	0

XREF FILE : Topo99

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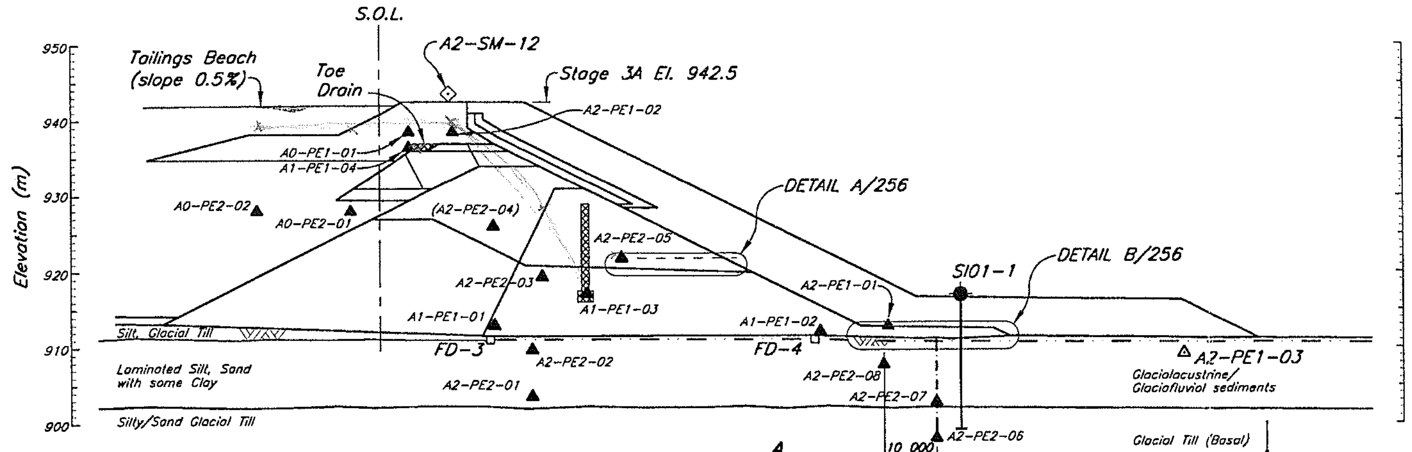
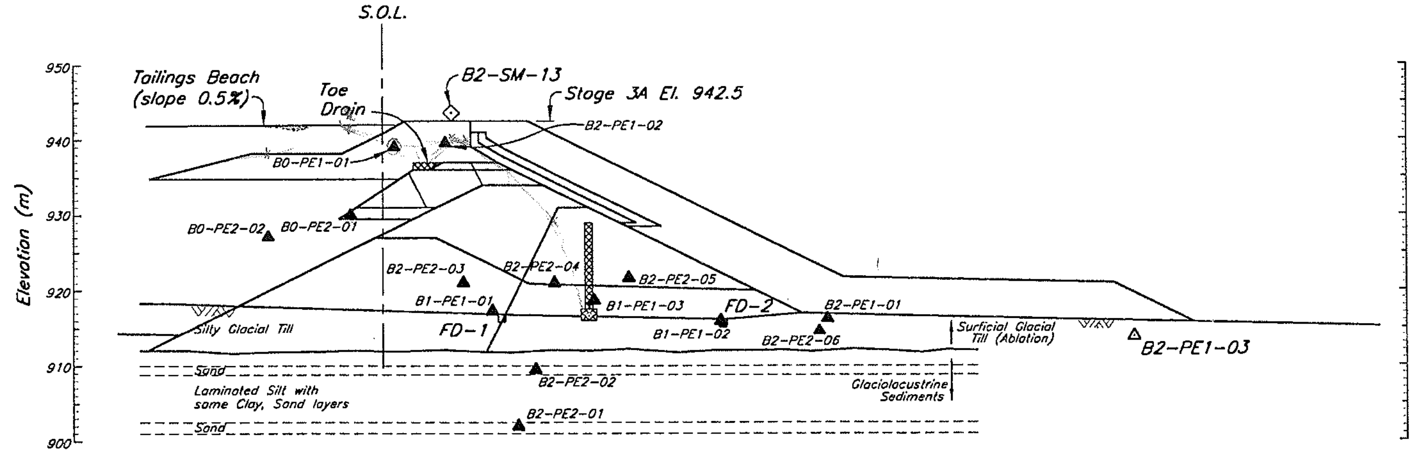
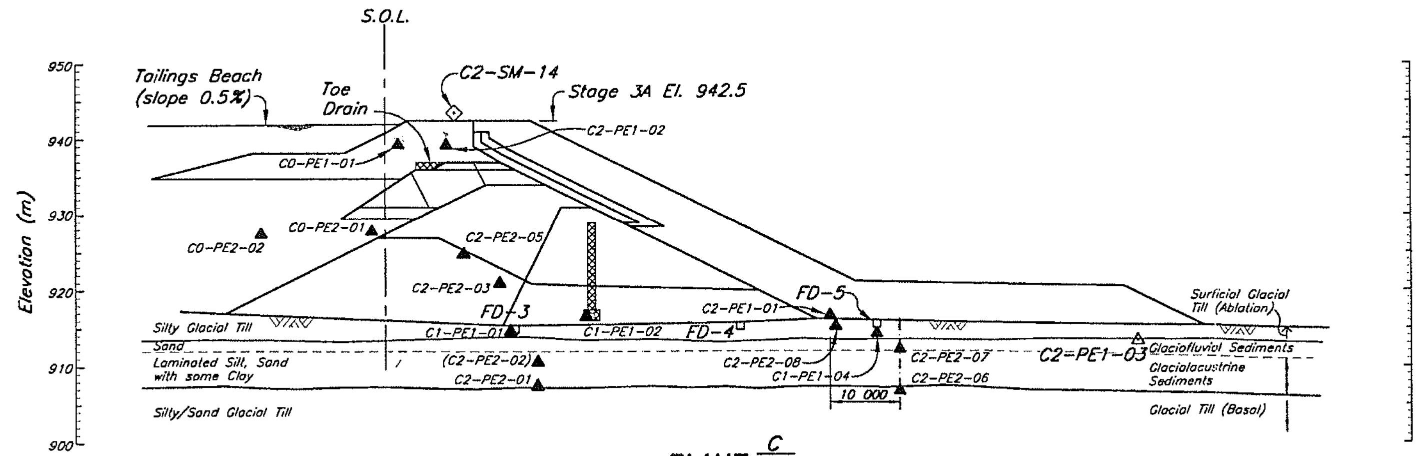


PLANE A/236
CH. 20+00



PLANE B/236
CH. 22+40



PLANE C/236
CH. 18+50

LEGEND

- ▲ A1-PE1-01 Previously installed Piezometer
- △ A2-PE2-06 New Stage 3 Piezometer
- ◇ A2-SM-01 New Embankment Survey Monument
- SI01-1 Slope Inclinometer

NOTES

1. Piezometers are vibrating wire type, SINCA Model 52611030 and RST Model 45005-0100 with a pressure rating of 100 psi or equivalent, connected to a readout panel via standard non-vented direct burial cable.
2. Zone fill materials and drain pipes not shown in drawing for clarity.

Scale 10 0 10 20 30 40 50 m

NOT FOR CONSTRUCTION

- DISCLAIMER -

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MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
EXISTING INSTRUMENTATION
PLANES A, B AND C

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	242	0

REFERENCE DRAWINGS

DRG. NO.	DESCRIPTION
244	EXISTING INSTRUMENTATION - PLANES E, F, G AND H
236	EXISTING INSTRUMENTATION IN MAIN EMBANKMENT - PLAN

REVISIONS

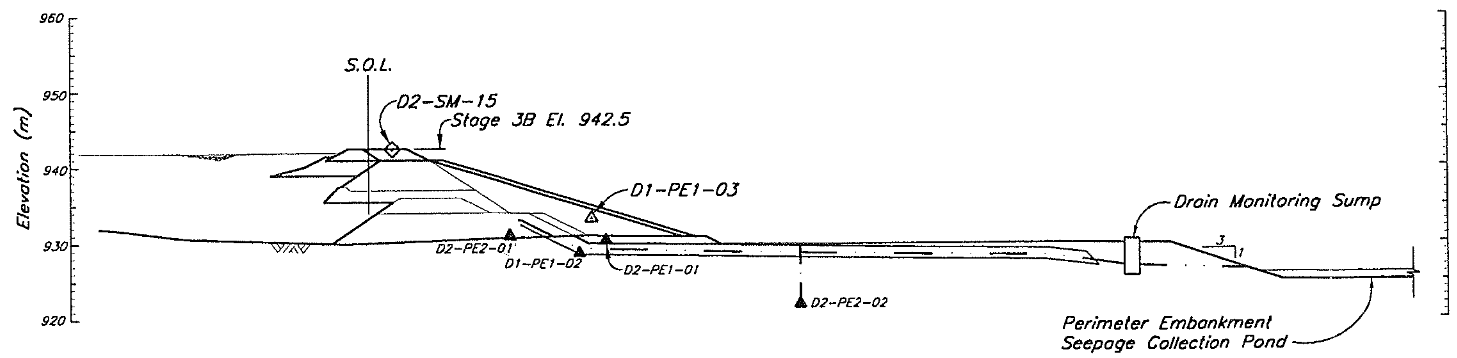
REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

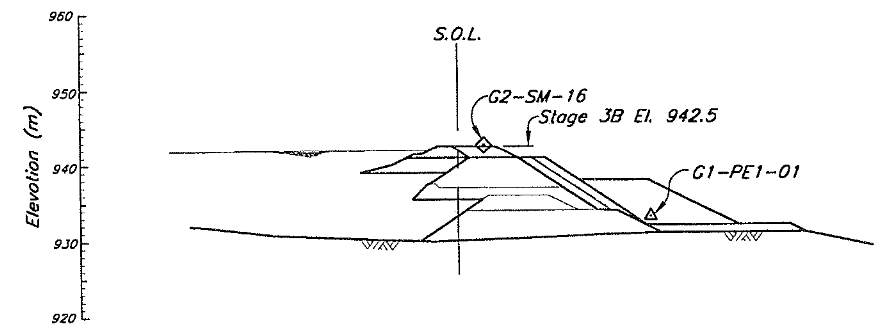
REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	ND		KJB

XREF FILE : -

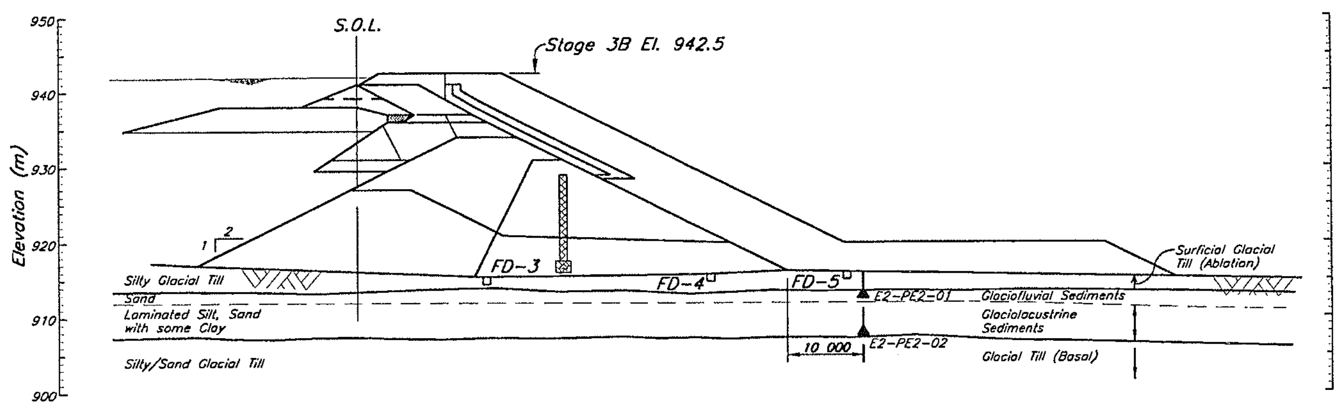
VANCOUVER B.C. CAD FILE: M:\1\01\00001\08\A\Acad\Dwgs\242\242.dwg 1=500 PLOT 1=1(PS) Mar 01 2005 Time 09:26



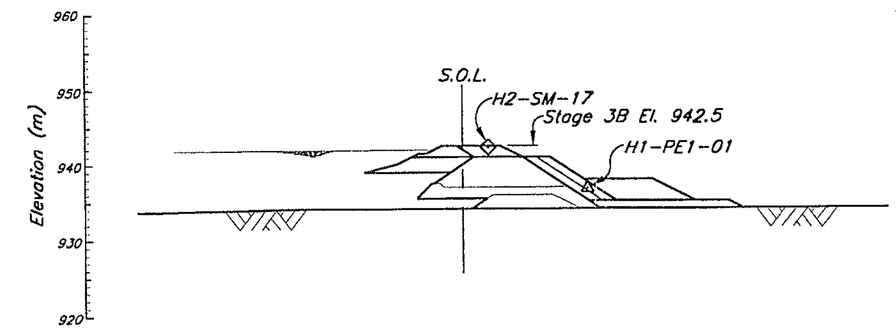
PLANE D/238
CH. 39+86



PLANE G/238
CH. 43+00



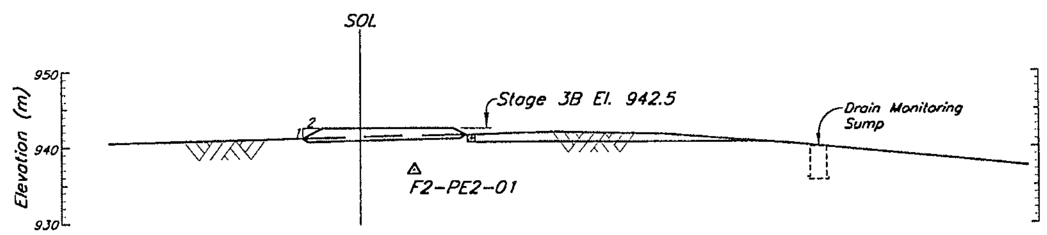
PLANE E/236
CH. 17+60



PLANE H/238
CH. 36+00

NOTES

1. Piezometers are vibrating wire type, SINCA Model 52611030 and RST Model 45005-0100 with a pressure rating of 100 psi or equivalent, connected to a readout panel via standard non-vented direct burial cable.
2. Zone fill materials and drain pipes not shown in drawing for clarity.



PLANE F/240
CH. 7+19

LEGEND

- ▲ A1-PE1-01 Previously installed Piezometer
- △ A2-PE2-06 New Stage 3 Piezometer
- ◇ A2-SM-01 New Embankment Survey Monument

Scale 10 0 10 20 30 40 50 m

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MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
EXISTING INSTRUMENTATION
PLANES D, E, F, G AND H

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	244	0

REFERENCE DRAWINGS

DRG. NO.	DESCRIPTION
240	EXISTING INSTRUMENTATION – SOUTH EMBANKMENT – PLAN
238	EXISTING INSTRUMENTATION – PERIMETER EMBANKMENT – PLAN
236	EXISTING INSTRUMENTATION – MAIN EMBANKMENT – PLAN

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	ND		

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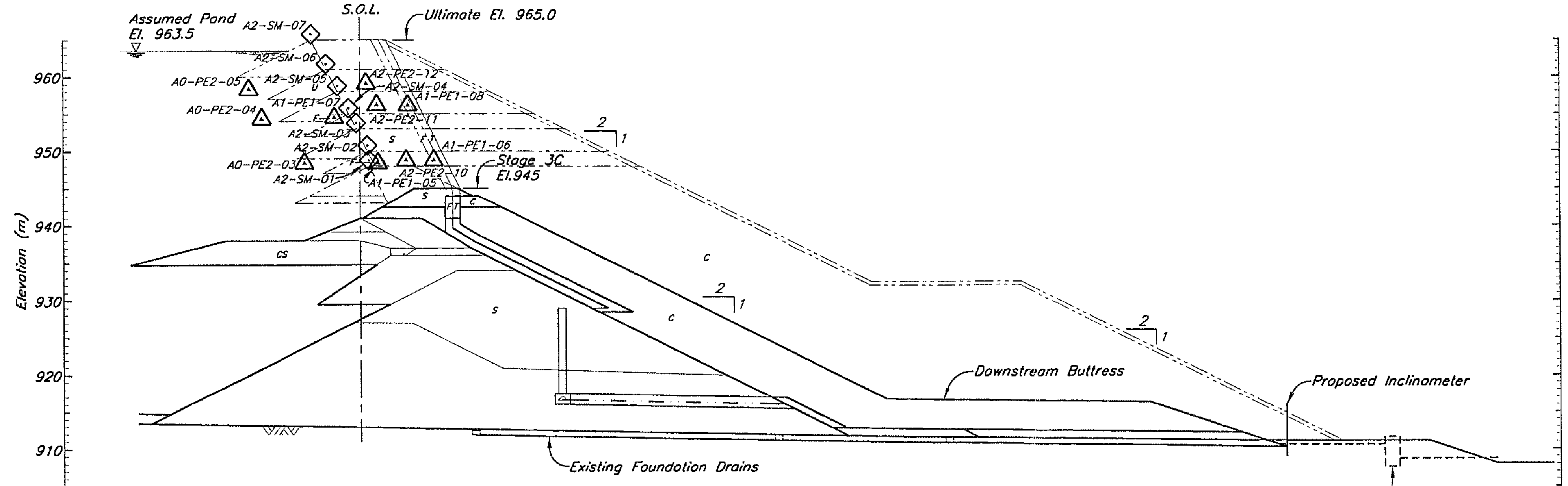
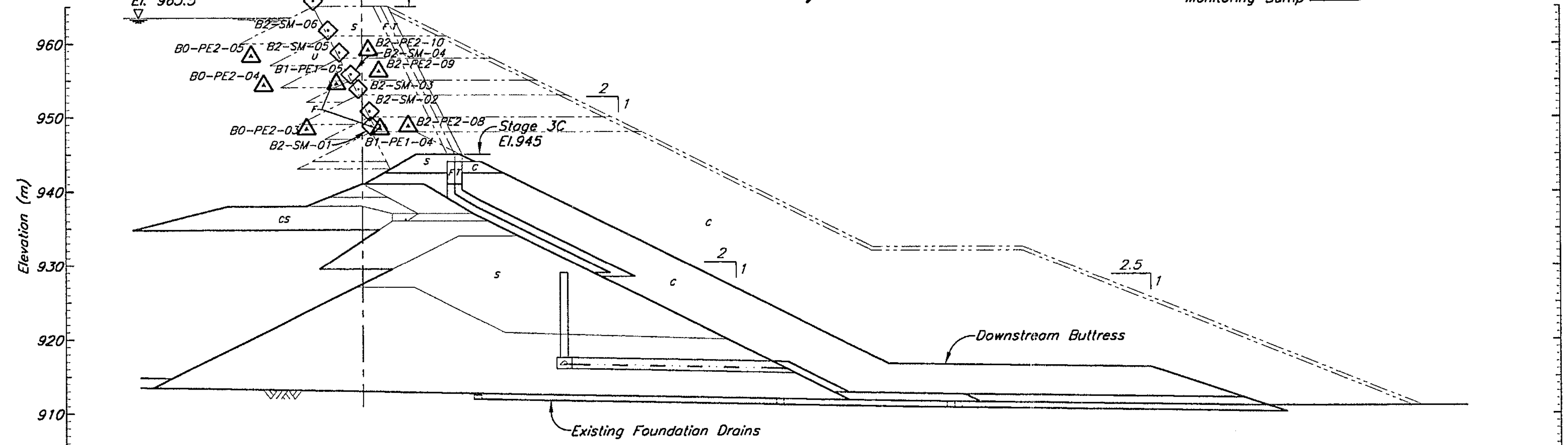
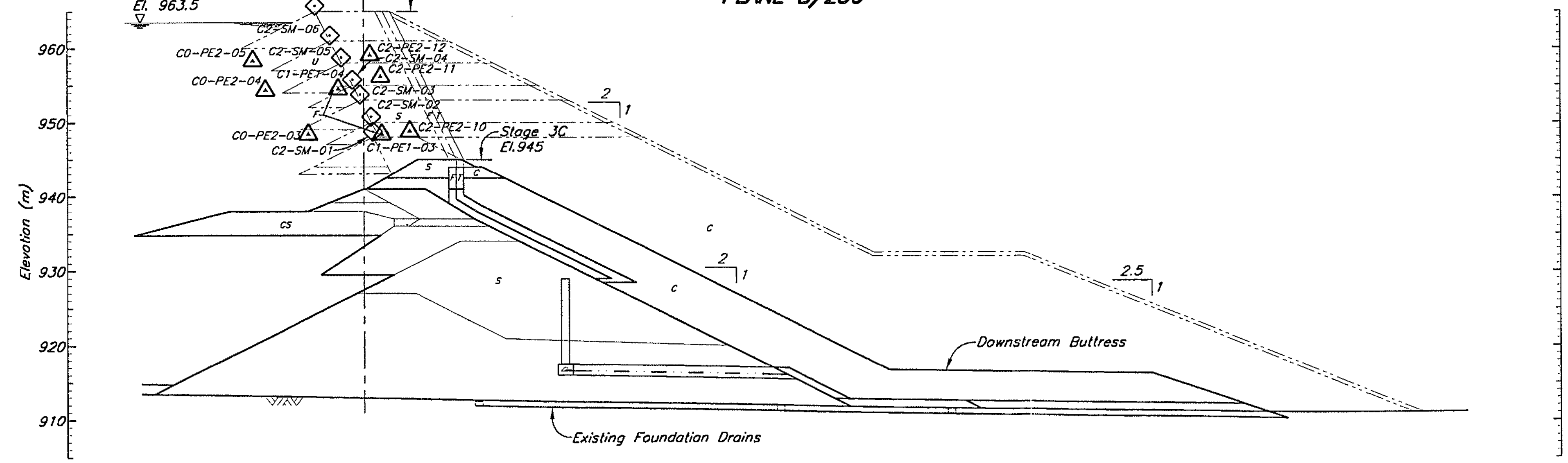


PLANE A/236



PLANE B/236



PLANE C/236

NOTES

1. Piezometers locations are approximate and may vary for individual Planes. Final location to be assessed during each design phase. Final configuration will be determined by the Engineer.
2. For Summary Of Instrumentation Installations, see Drg. 247.

LEGEND

A0-PE1-01
- Plane I.D. (A, B etc.)
- Area (0-Tailings, 1-Drain, 2-Embankment)
- Number I.D.
- Pressure Rating (1-Low, 2-High)
- Type of Instrumentation (PE-Piezometer electric, SM-Survey Monument)

A2-PE2-09 △ Proposed Piezometer

A2-SM-07 ◇ Proposed Embankment Survey Monument

NOT FOR CONSTRUCTION

Scale 8 0 8 16 24 32 40 m

DRG. NO.	DESCRIPTION
247	PROPOSED INSTRUMENTATION - MAIN EMBANKMENT - PLANE E
236	EXISTING INSTRUMENTATION - MAIN EMBANKMENT - PLAN

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	NSD	KJ	KJS

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MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
PROPOSED INSTRUMENTATION
MAIN EMBANKMENT
PLANES A, B, AND C

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	246	0

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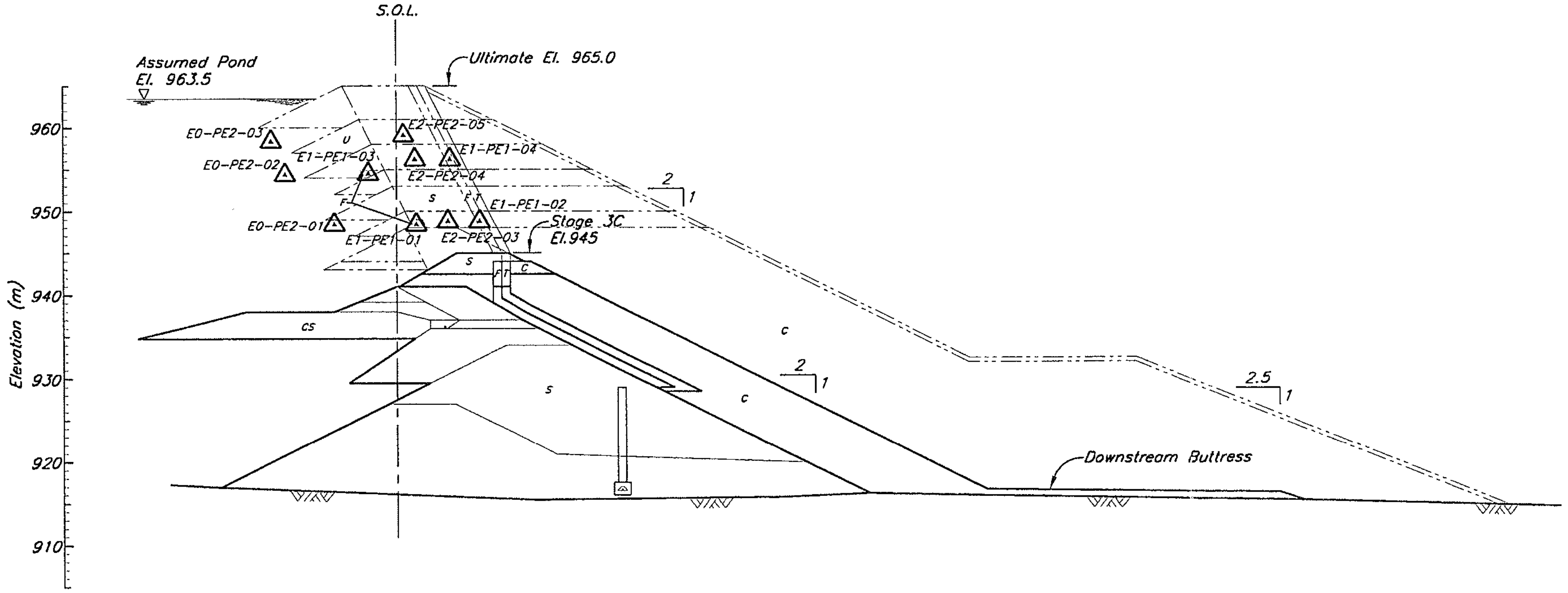

PLANE E/236

Summary Of Instrumentation Installations		
INSTRUMENTATION ID	LOCATION	MATERIAL
A0-PE2-03	Tailings	Tailings
A0-PE2-04	Tailings	Tailings
A0-PE2-05	Tailings	Tailings
A1-PE1-05	Toe Drain	Zone F
A1-PE1-06	Filter Drain	Zone F
A1-PE1-07	Toe Drain	Zone F
A1-PE1-08	Filter Drain	Zone F
A2-PE2-10	Fill	Zone S
A2-PE2-11	Fill	Zone S
A2-PE2-12	Fill	Zone S
A2-SM-01	Emb. Crest	Zone S
A2-SM-02	Emb. Crest	Zone S
A2-SM-03	Emb. Crest	Zone S
A2-SM-04	Emb. Crest	Zone S
A2-SM-05	Emb. Crest	Zone S
A2-SM-06	Emb. Crest	Zone S
A2-SM-07	Emb. Crest	Zone S
B0-PE2-03	Tailings	Tailings
B0-PE2-04	Tailings	Tailings
B0-PE2-05	Tailings	Tailings
B1-PE1-04	Toe Drain	Zone F
B1-PE1-05	Toe Drain	Zone F
B2-PE2-09	Fill	Zone S
B2-PE2-10	Fill	Zone S
B2-PE2-11	Fill	Zone S
B2-SM-01	Emb. Crest	Zone S
B2-SM-02	Emb. Crest	Zone S
B2-SM-03	Emb. Crest	Zone S
B2-SM-04	Emb. Crest	Zone S
B2-SM-05	Emb. Crest	Zone S
B2-SM-06	Emb. Crest	Zone S
B2-SM-07	Emb. Crest	Zone S

Summary Of Instrumentation Installations		
INSTRUMENTATION ID	LOCATION	MATERIAL
C0-PE2-03	Tailings	Tailings
C0-PE2-04	Tailings	Tailings
C0-PE2-05	Tailings	Tailings
C1-PE1-03	Toe Drain	Zone F
C1-PE1-04	Toe Drain	Zone F
C2-PE2-10	Fill	Zone S
C2-PE2-11	Fill	Zone S
C2-PE2-12	Fill	Zone S
C2-SM-01	Emb. Crest	Zone S
C2-SM-02	Emb. Crest	Zone S
C2-SM-03	Emb. Crest	Zone S
C2-SM-04	Emb. Crest	Zone S
C2-SM-05	Emb. Crest	Zone S
C2-SM-06	Emb. Crest	Zone S
C2-SM-07	Emb. Crest	Zone S
E0-PE2-01	Tailings	Tailings
E0-PE2-02	Tailings	Tailings
E0-PE2-03	Tailings	Tailings
E1-PE1-01	Toe Drain	Zone F
E1-PE1-02	Filter Drain	Zone F
E1-PE1-03	Toe Drain	Zone F
E1-PE1-04	Filter Drain	Zone F
E2-PE2-03	Fill	Zone S
E2-PE2-04	Fill	Zone S
E2-PE2-05	Fill	Zone S
S101-03	Fill	Zone C
S101-04	Fill	Zone C
S101-05	Fill	Zone C

NOTE
1. For NOTES and LEGEND, see Drg. 246.

NOT FOR CONSTRUCTION

Scale 8 0 8 16 24 32 40 m

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Knight Piésold CONSULTING

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
PROPOSED INSTRUMENTATION
MAIN EMBANKMENT
PLANE E

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	247	0

DRG. NO.	DESCRIPTION
246	PROPOSED INSTRUMENTATION - MAIN EMBANKMENT - PLANES A, B & C
236	EXISTING INSTRUMENTATION - MAIN EMBANKMENT - PLAN

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	NSD		

REVISIONS

XREF FILE: -

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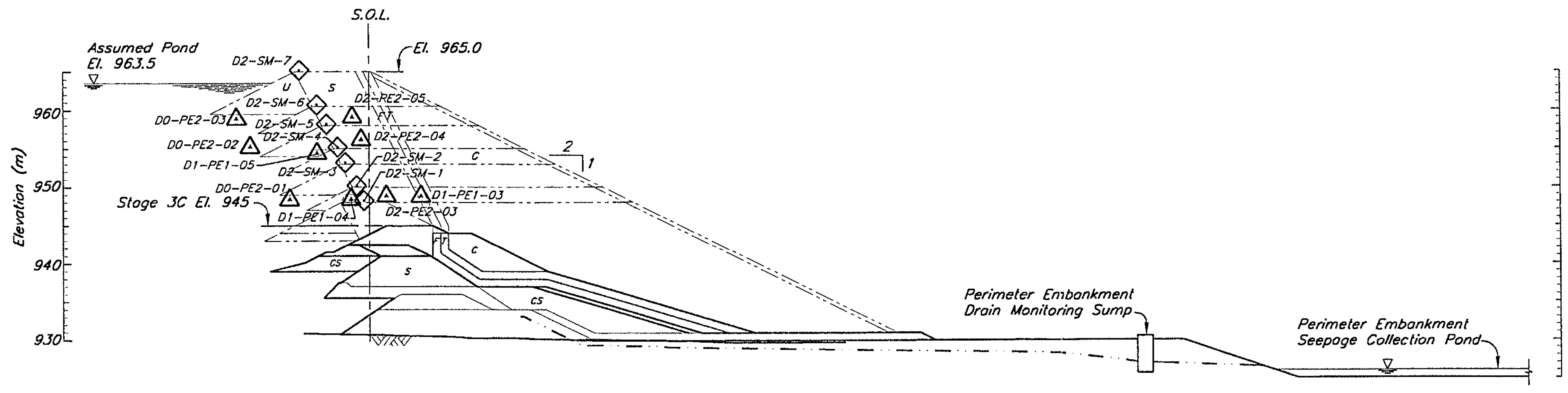
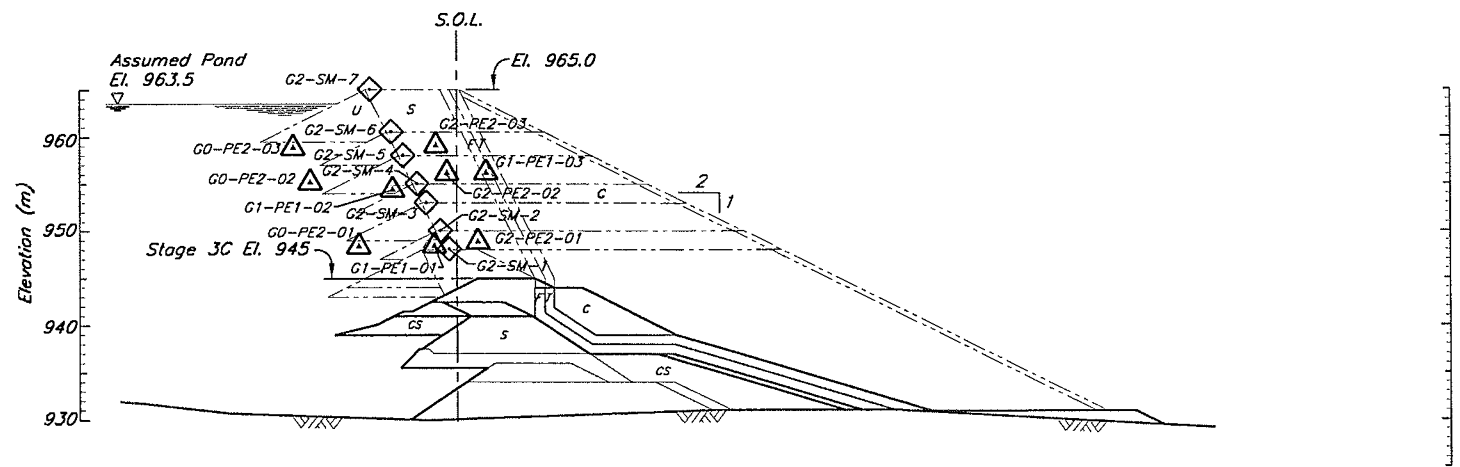
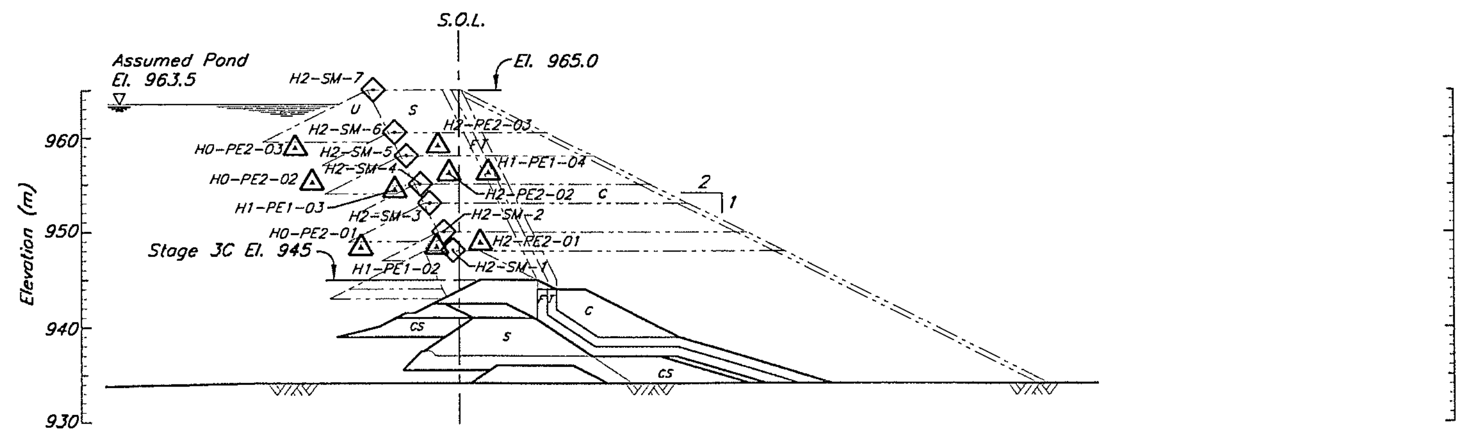


PLANE D/238



PLANE G/238



PLANE H/238

NOTE

1. Piezometers locations are approximate and may vary for individual Planes. Final location to be assessed during each design phase. Final configuration will be determined by the Engineer.

Summary Of Instrumentation Installations

PIEZOMETER ID	LOCATION	MATERIAL
D0-PE2-01	Tailings	Tailings
D0-PE2-02	Tailings	Tailings
D0-PE2-03	Tailings	Tailings
D1-PE1-04	Drain	Zone F
D1-PE1-05	Drain	Zone F
D1-PE1-06	Drain	Zone F
D2-PE2-03	Fill	Zone S
D2-PE2-04	Fill	Zone S
D2-PE2-05	Fill	Zone S
D2-SM-1	Emb. Crest	Zone S
D2-SM-2	Emb. Crest	Zone S
D2-SM-3	Emb. Crest	Zone S
D2-SM-4	Emb. Crest	Zone S
D2-SM-5	Emb. Crest	Zone S
D2-SM-6	Emb. Crest	Zone S
D2-SM-7	Emb. Crest	Zone S
G0-PE2-01	Tailings	Tailings
G0-PE2-02	Tailings	Tailings
G0-PE2-03	Tailings	Tailings
G1-PE1-01	Drain	Zone F
G1-PE1-02	Drain	Zone F
G1-PE1-03	Drain	Zone F
G2-PE2-01	Fill	Zone S
G2-PE2-02	Fill	Zone S
G2-PE2-03	Fill	Zone S
G2-SM-1	Emb. Crest	Zone S
G2-SM-2	Emb. Crest	Zone S
G2-SM-3	Emb. Crest	Zone S
G2-SM-4	Emb. Crest	Zone S
G2-SM-5	Emb. Crest	Zone S
G2-SM-6	Emb. Crest	Zone S
G2-SM-7	Emb. Crest	Zone S
H0-PE2-01	Tailings	Tailings
H0-PE2-02	Tailings	Tailings
H0-PE2-03	Tailings	Tailings
H1-PE1-02	Drain	Zone F
H1-PE1-03	Drain	Zone F
H1-PE1-04	Drain	Zone F
H2-PE2-01	Fill	Zone S
H2-PE2-02	Fill	Zone S
H2-PE2-03	Fill	Zone S
H2-SM-1	Emb. Crest	Zone S
H2-SM-2	Emb. Crest	Zone S
H2-SM-3	Emb. Crest	Zone S
H2-SM-4	Emb. Crest	Zone S
H2-SM-5	Emb. Crest	Zone S
H2-SM-6	Emb. Crest	Zone S
H2-SM-7	Emb. Crest	Zone S

LEGEND

A0-PE1-01
- Plane I.D. (A, B etc.)
- Area (0-Tailings, 1-Drain, 2-Embankment)
- Number I.D.
- Pressure Rating (1-Low, 2-High)
- Type of Instrumentation (PE-Piezometer electric, SM-Survey Monument)

D2-PE2-05 △ Proposed Piezometer

D2-SM-2 ◇ Proposed Embankment Survey Monument

NOT FOR CONSTRUCTION

Scale 8 0 8 16 24 32 40 m

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MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
PROPOSED INSTRUMENTATION
PERIMETER EMBANKMENT
PLANES D, G AND H

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	248	0

DRG. NO.	DESCRIPTION
238	EXISTING INSTRUMENTATION - PERIMETER EMBANKMENT - PLAN

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	NSD		

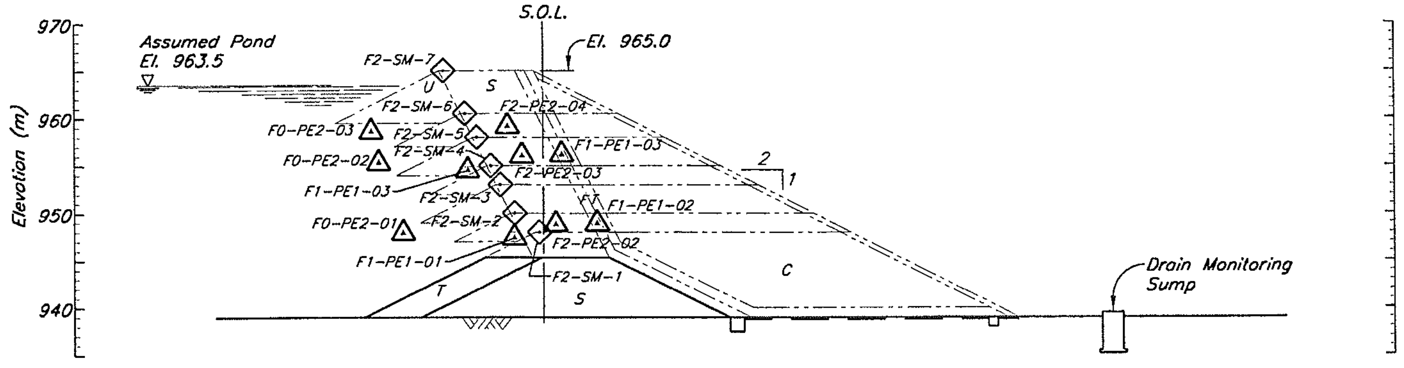
REVISIONS

VANCOUVER B.C. CAD FILE: M:\1\01\00001\08\A\Acad\Dwgs\248\248.dwg 1=400 PLOT 1=1(PS) March 11 2005 nd

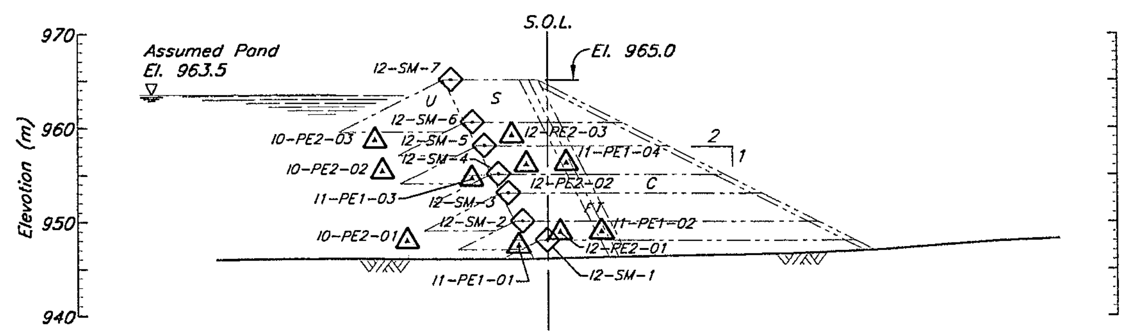
XREF FILE: -

NOTE

1. Piezometers locations are approximate and may vary for individual Planes. Final location to be assessed during each design phase. Final configuration will be determined by the Engineer.



PLANE F/240



PLANE I/240

Summary Of Instrumentation Installations		
INSTRUMENTATION ID	LOCATION	MATERIAL
F0-PE2-01	Tailings	Tailings
F0-PE2-02	Tailings	Tailings
F0-PE2-03	Tailings	Tailings
F1-PE1-01	Toe Drain	Zone F
F1-PE1-02	Filter Drain	Zone F
F1-PE1-03	Toe Drain	Zone F
F1-PE1-04	Filter Drain	Zone F
F2-PE2-02	Fill	Zone S
F2-PE2-03	Fill	Zone S
F2-PE2-04	Fill	Zone S
F2-SM-1	Emb. Crest	Zone S
F2-SM-2	Emb. Crest	Zone S
F2-SM-3	Emb. Crest	Zone S
F2-SM-4	Emb. Crest	Zone S
F2-SM-5	Emb. Crest	Zone S
F2-SM-6	Emb. Crest	Zone S
F2-SM-7	Emb. Crest	Zone S
I0-PE2-01	Tailings	Tailings
I0-PE2-02	Tailings	Tailings
I0-PE2-03	Tailings	Tailings
I1-PE1-01	Toe Drain	Zone F
I1-PE1-02	Filter Drain	Zone F
I1-PE1-03	Toe Drain	Zone F
I1-PE1-04	Filter Drain	Zone F
I2-PE2-01	Fill	Zone S
I2-PE2-02	Fill	Zone S
I2-PE2-03	Fill	Zone S
I2-SM-1	Emb. Crest	Zone S
I2-SM-2	Emb. Crest	Zone S
I2-SM-3	Emb. Crest	Zone S
I2-SM-4	Emb. Crest	Zone S
I2-SM-5	Emb. Crest	Zone S
I2-SM-6	Emb. Crest	Zone S
I2-SM-7	Emb. Crest	Zone S

LEGEND

A0-PE1-01
- Plane I.D. (A, B etc.)
- Area (0–Tailings, 1–Drain, 2–Embankment)
- Number I.D.
- Pressure Rating (1–Low, 2–High)
- Type of Instrumentation (PE–Piezometer electric, SM–Survey Monument)

F2-PE2-03 △ Proposed Piezometer

F2-SM-24 ◇ Proposed Embankment Survey Monument

NOT FOR CONSTRUCTION

Scale 8 0 8 16 24 32 40 m

CAD FILE: M:\1\01\00001\08\A\Acad\Dwgs\249\249.dwg 1=400 PLOT 1=1(PS) March 11 2005 nd VANCOUVER B.C.

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MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
PROPOSED INSTRUMENTATION
SOUTH EMBANKMENT
PLANES F AND I

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	249	0

REFERENCE DRAWINGS

DRG. NO.	DESCRIPTION
240	EXISTING INSTRUMENTATION – SOUTH EMBANKMENT – PLAN

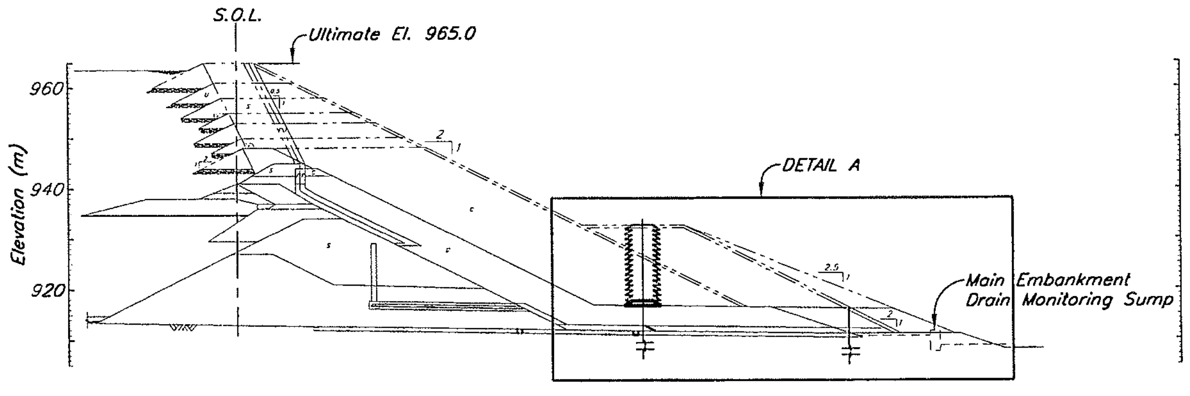
REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

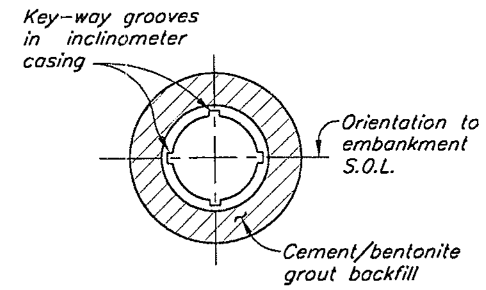
REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	NSD		KJB

XREF FILE :



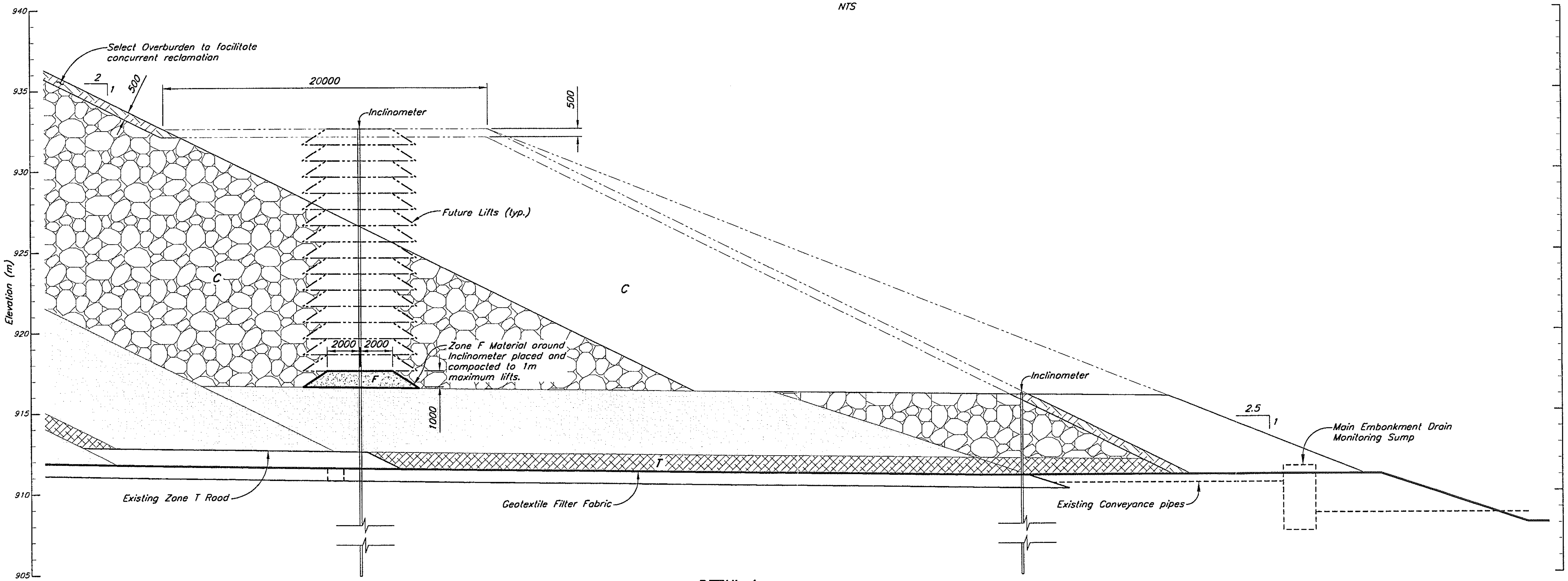
MAIN EMBANKMENT
NTS



TYPICAL SECTION
INCLINOMETER
NTS

NOTES

1. For zone material specifications and legend see Drg. 104.
2. All dimensions in millimetres and elevations in metres, unless noted otherwise.
3. Drawing is for reference only. IFC drawings will be issued for each stage construction.
4. Crest details to be revised to suit final reclamation objectives. A suitable wearing course, topsoil cover and revegetation are anticipated.
5. Three new inclinometers to be installed to function both as new monitoring points and as replacement installations in the event that existing inclinometers are destroyed.



DETAIL A

NOT FOR CONSTRUCTION

Scale 2 0 2 4 6 8 10 m

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MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
INCLINOMETER EXTENSION
SECTIONS AND DETAILS

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	250	0

DRG. NO.	DESCRIPTION
–	–

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	JT		KJB

REVISIONS

XREF FILE : –

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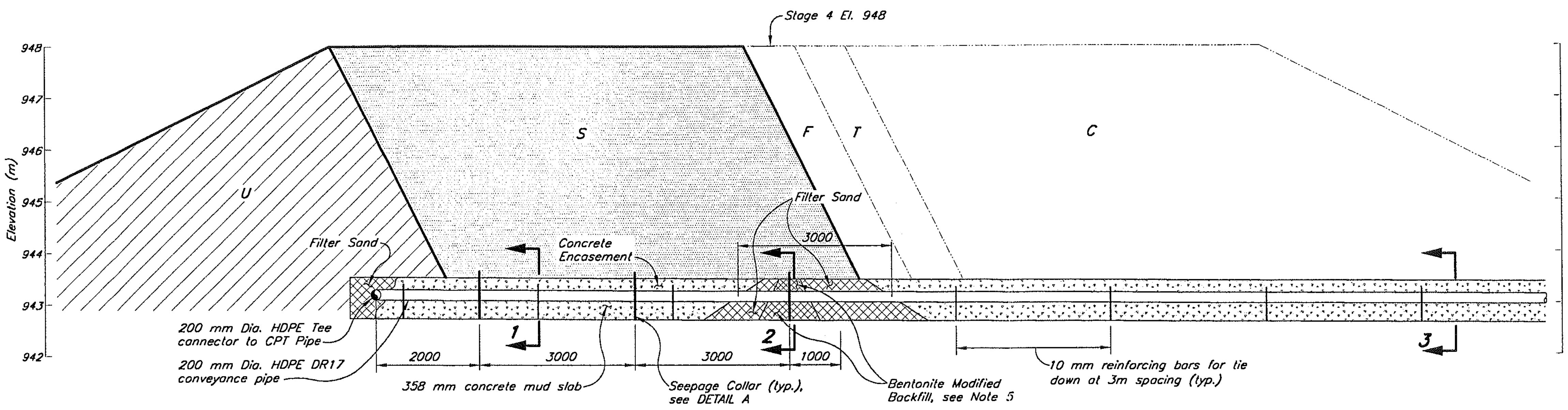
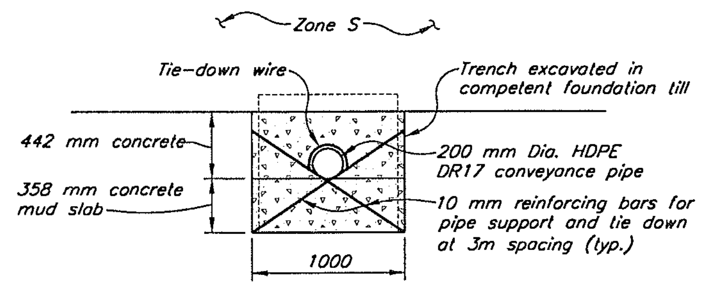


TYPICAL SECTION OF UPSTREAM TOE DRAIN AT ABUTMENTS

Scale A

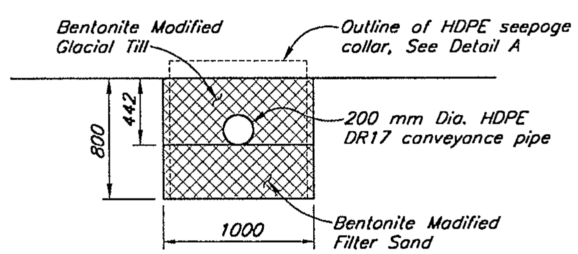
NOTES

1. Subgrade preparation comprised stripping of topsoil and organics and removing saturated materials to establish a competent bearing surface for fill placement as directed by the Engineer.
2. All downstream pipeworks have a minimum of 1 m of cover for frost protection.
3. All HDPE pipe penetrations to be water tight.
4. HDPE seepage collar fabricated and welded to pipe prior to delivery to site.
5. Select fine grained backfill and filter sand below with 10% bentonite, placed and compacted in max. 300 mm lifts.
6. Locations of Toe Drains to be in competent foundation materials as determined by the Engineer.



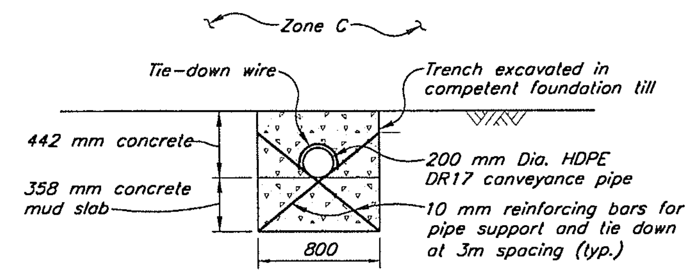
SECTION 1

Scale B



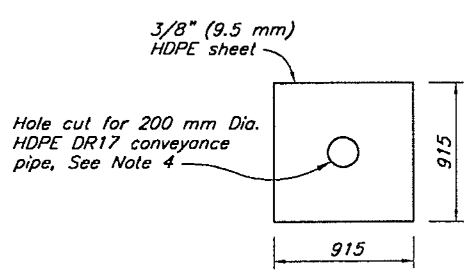
SECTION 2

Scale B



SECTION 3

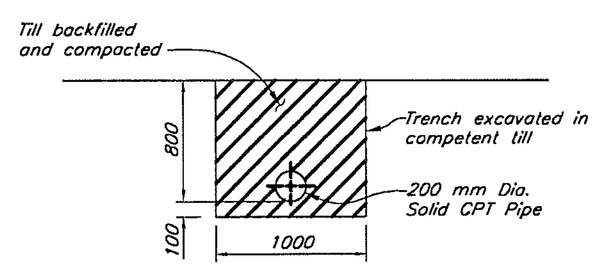
Scale B



DETAIL A

HDPE Seepage Collar

Scale B



DETAIL B/125

Scale B

NOT FOR CONSTRUCTION

B 0.5 0 0.5 1 1.5 2 2.5 m

A 1 0 1 2 3 4 5 m

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MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
UPSTREAM TOE DRAIN
GENERAL DETAILS AND SECTIONS

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	255	0

DRG. NO.	DESCRIPTION
125	ULTIMATE PERIMETER EMBANKMENT – SECTIONS
120	ULTIMATE PERIMETER EMBANKMENT – PLAN

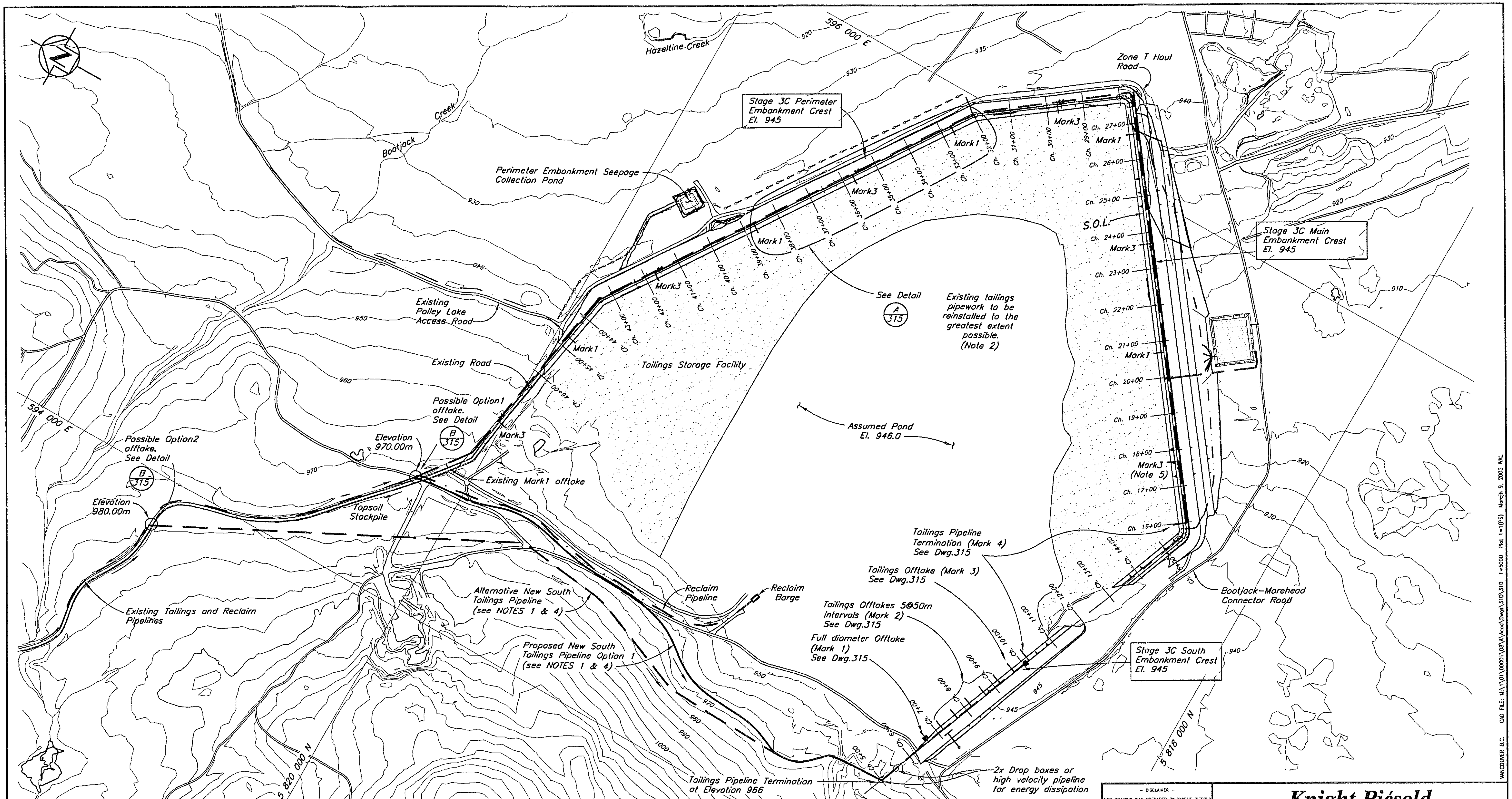
REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	AT	JT		

REVISIONS

XREF FILE: TOPO99

VANCOUVER B.C. CAD FILE: M:\1\01\00001\08\A\Acad\Dwgs\255\0255.dwg 1=50 PLOT 1=1(PS) March 14, 2005 by:wlobodo



NOTES

1. New South Tailing Pipeline to be 24" DR15.5 HDPE with steady downgrade to elevation 966m above ultimate abutment of South Embankment.
2. Existing pipework to be flushed, cleaned, and examined for damage prior to reuse. Damage or unsuitable material to be replaced with new.
3. Pipeline encased in culvert and buried as required under access road.
4. For typical detail of offtakes (Mark1 to Mark4) See Dwg.315

NOT FOR CONSTRUCTION

Scale 100 0 100 200 300 400 500m

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TAILINGS STORAGE FACILITY
TAILINGS PIPEWORK OPTIONS
STAGE 4/5 - PLAN

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	310	0

REFERENCE DRAWINGS

DRG. NO.	DESCRIPTION
315	TAILINGS PIPEWORK - DETAILS
312	TAILINGS PIPEWORK PROFILES - SHEET 1

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	HPD	LAK		

XREF FILE : Topo2004_CA

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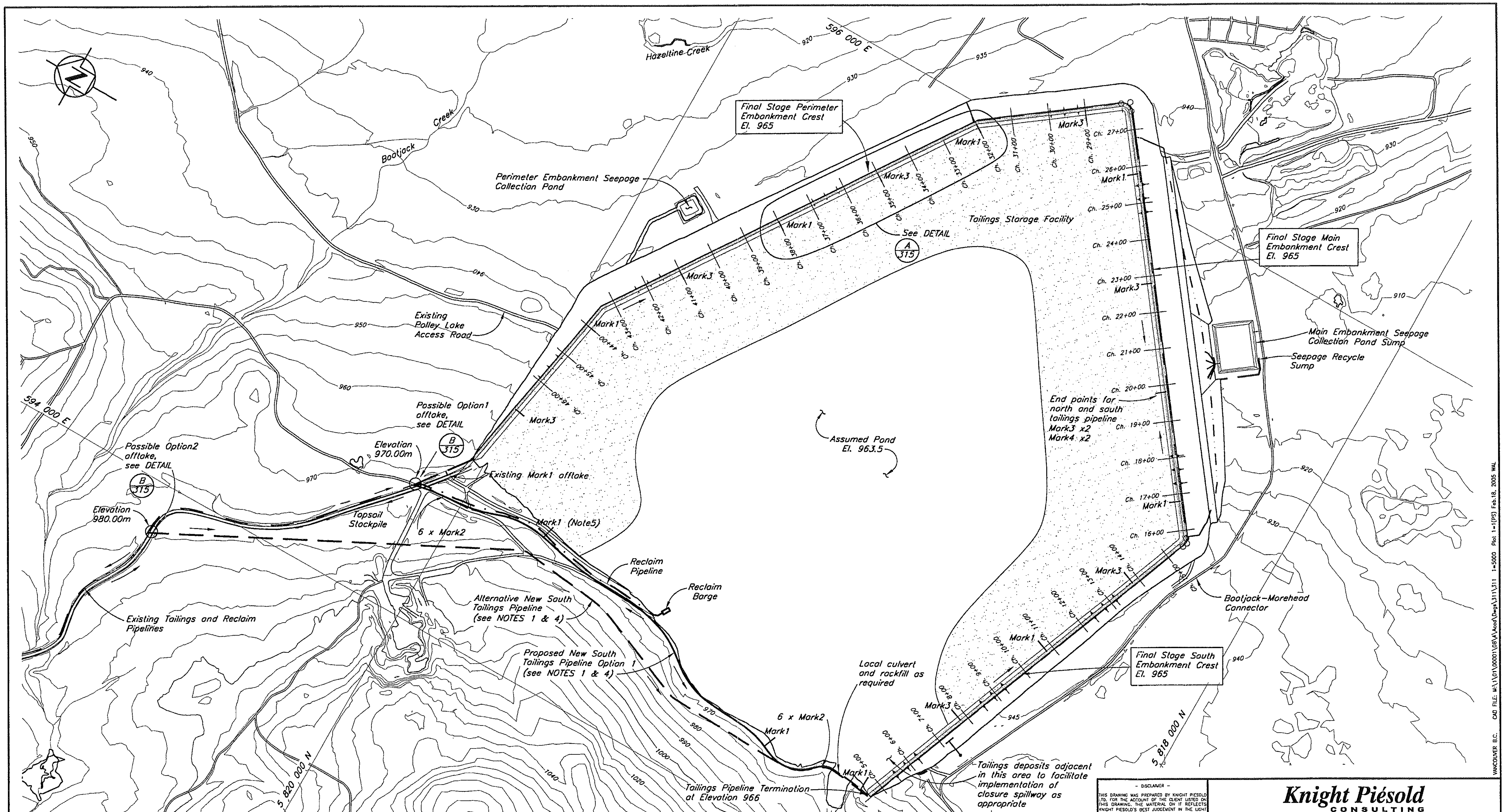

NOTES

1. New South Tailing Pipeline to be 24" DR15.5 HDPE with steady downgrade to elevation 966m above ultimate abutment of South Embankment.
2. Existing pipework to be flushed, cleaned, and examined for damage prior to reuse. Damage or unsuitable material to be replaced with new.
3. Pipeline encased in culvert and buried as required under access road.
4. For typical detail of offtakes (Mark1 to Mark4) See Dwg.315

NOT FOR CONSTRUCTION

Scale 100 0 100 200 300 400 500m

DRG. NO.	DESCRIPTION
315	TAILINGS PIPEWORK - DETAILS
313	TAILINGS PIPEWORK AT 965m - PROFILES - SHEET 2

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	HPD	LAK		

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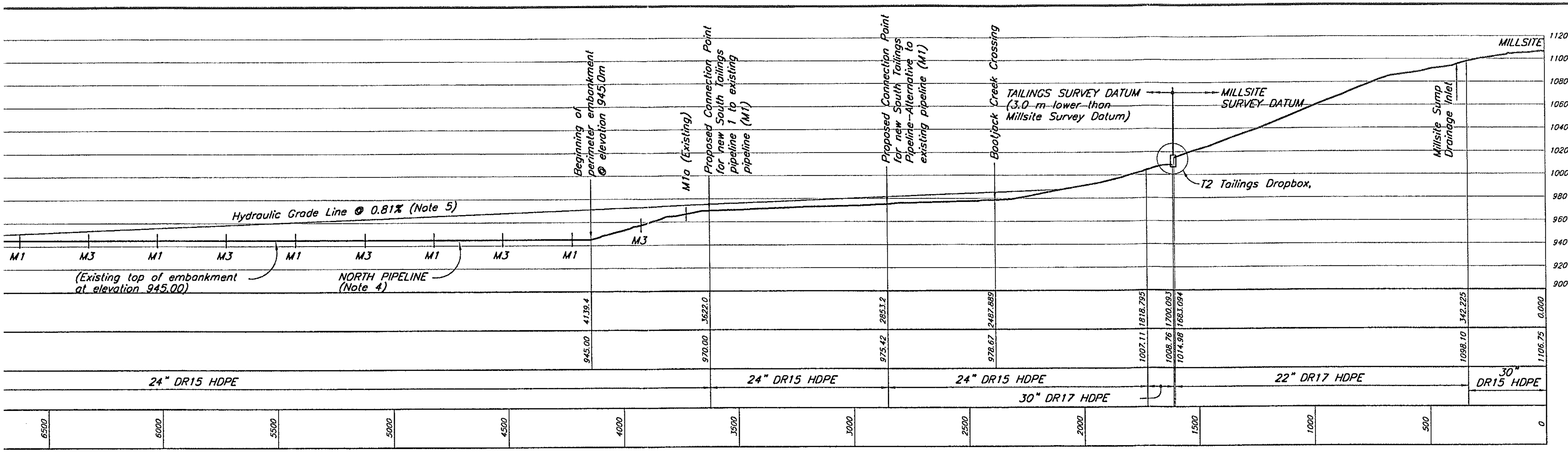
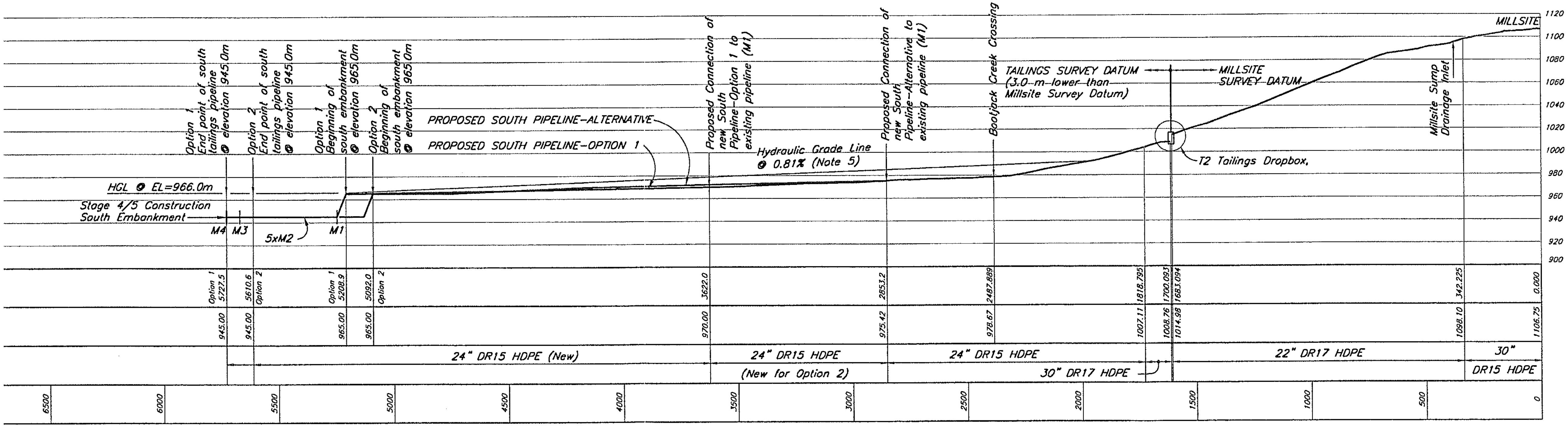
TAILINGS STORAGE FACILITY
TAILINGS PIPEWORK OPTIONS
FINAL STAGE - PLAN

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	311	0



EXISTING TAILINGS PIPELINE PROFILE – (NORTH PIPELINE)

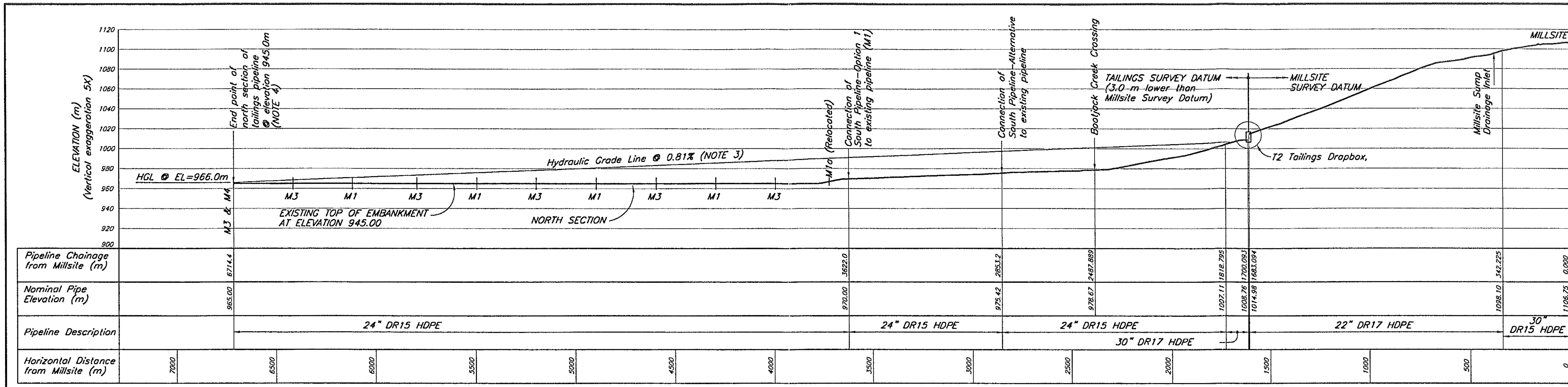


PROPOSED NEW TAILINGS PIPELINE PROFILES – (SOUTH PIPELINE) – OPTION 1 AND ALTERNATIVE (NOTE 1)

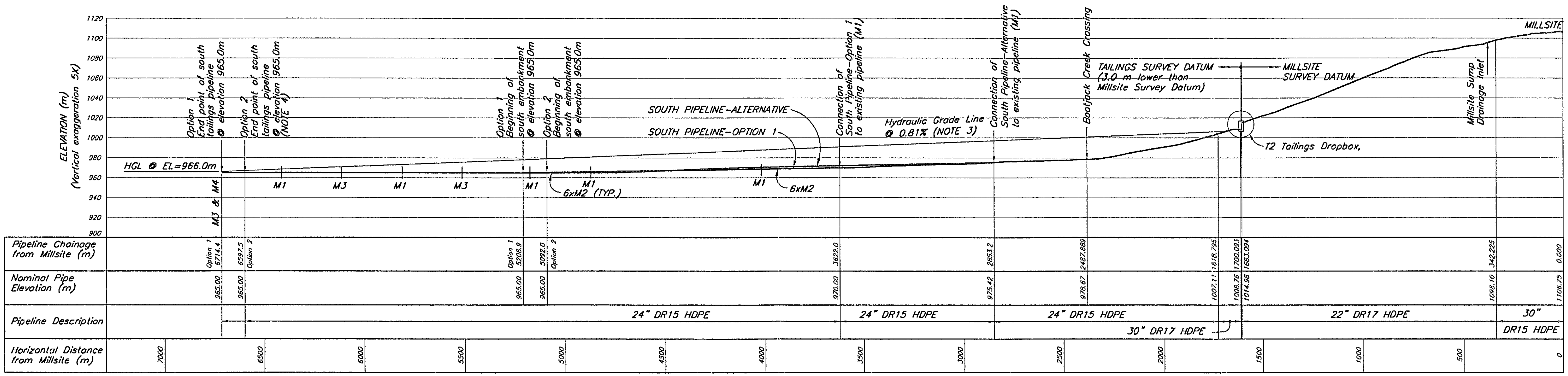
NOTES

1. For Option 1 tailings pipeline length is approximately

VANCOUVER B.C. PLOT 1=1(PS) Mar 1 2005



FUTURE TAILINGS PIPELINE PROFILE – (NORTH PIPELINE)



FUTURE TAILINGS PIPELINE PROFILES – (SOUTH PIPELINE) – OPTION 1 AND ALTERNATIVE (NOTE 1)

LEGEND (NOTE 2)

M1	Mark 1 Offtake
M2	Mark 2 Offtake
M3	Mark 3 Offtake
M4	Mark 4 Offtake
DR9	HDPE Pipe Dimensional Ratio (typical)

NOTES

1. For Option 1 tailings pipeline length is approximately 117m longer at ultimate west abutment of South Embankment than Alternative.
2. Tailings offtakes (Mark 1 to 4) are shown on Dwg. No. 315, Details
3. Hydraulic Grade Line assumes 20,000tpd @ 35% solids.
4. Pipe "end point" selected such that north and south tailings lines are of similar length.

NOT FOR CONSTRUCTION

Scale 200 0 200 400 600 800 1000 m

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MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
TAILINGS PIPEWORK AT 965m
PROFILES – SHEET 2

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	313	0

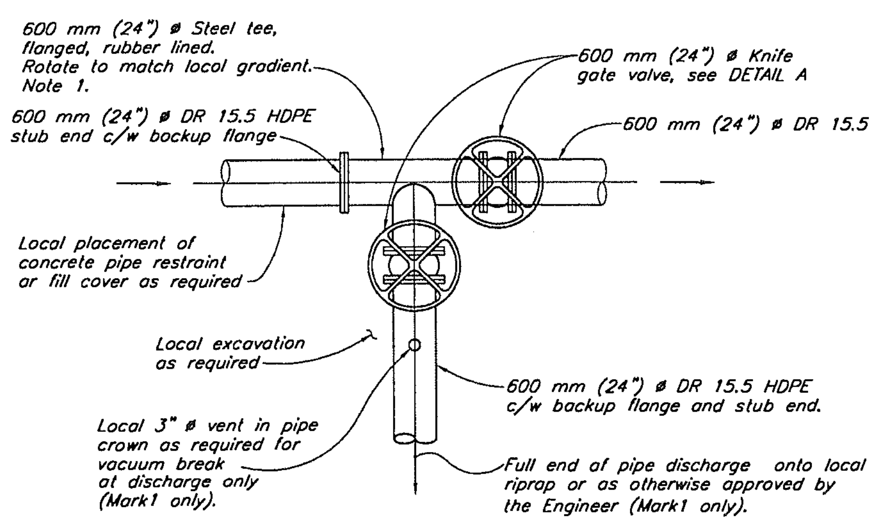
DRG. NO.	DESCRIPTION
315	TAILINGS PIPEWORK DETAILS
311	TAILINGS PIPEWORK OPTIONS – FINAL STAGE – PLAN

REFERENCE DRAWINGS

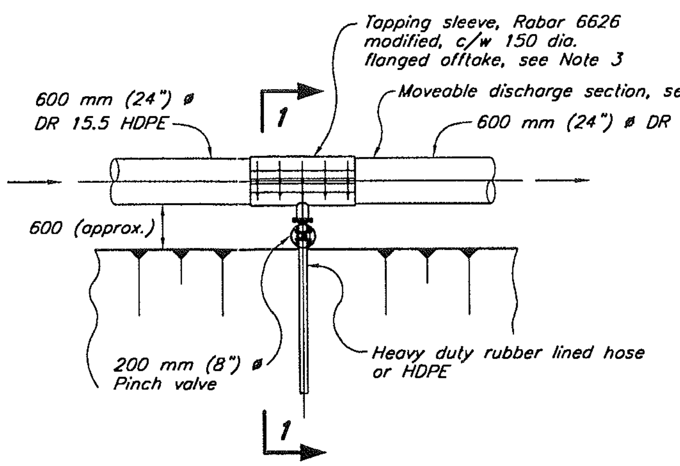
REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	09MAR'05	ISSUED FOR REPORT	HPD	LK		

REVISIONS

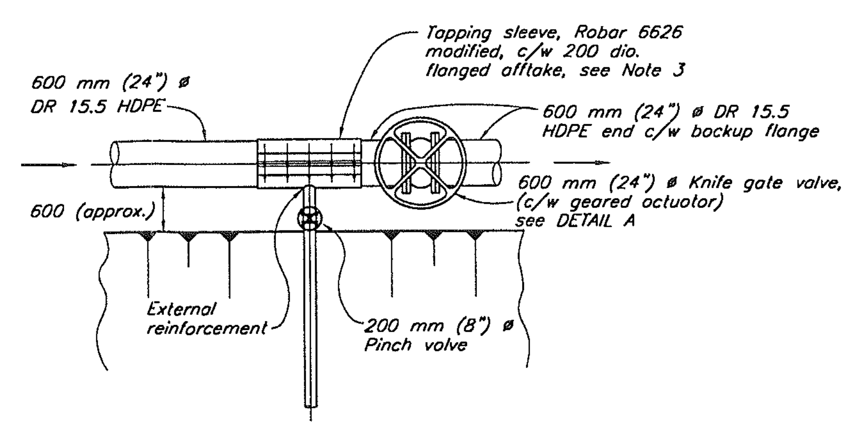
VANCOUVER B.C. CAD FILE: M:\1\01\00001\08\A\Acad\Dwgs\313\313.DWG 1=10000 PLOT 1=1(PS) Feb 21 2005



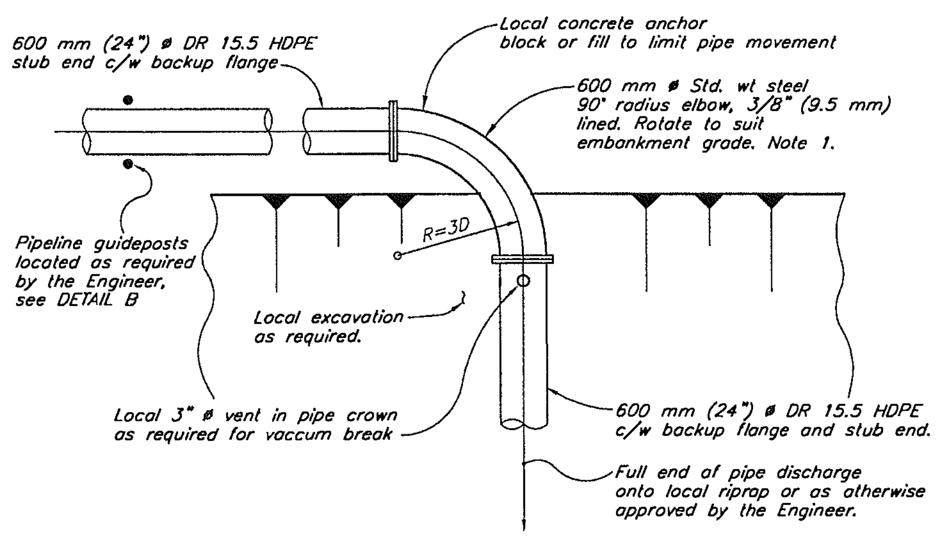
TAILINGS HEADER FULL DIAMETER OFFTAKE
(MARK 1), DETAIL B/310 B/311
Scale A



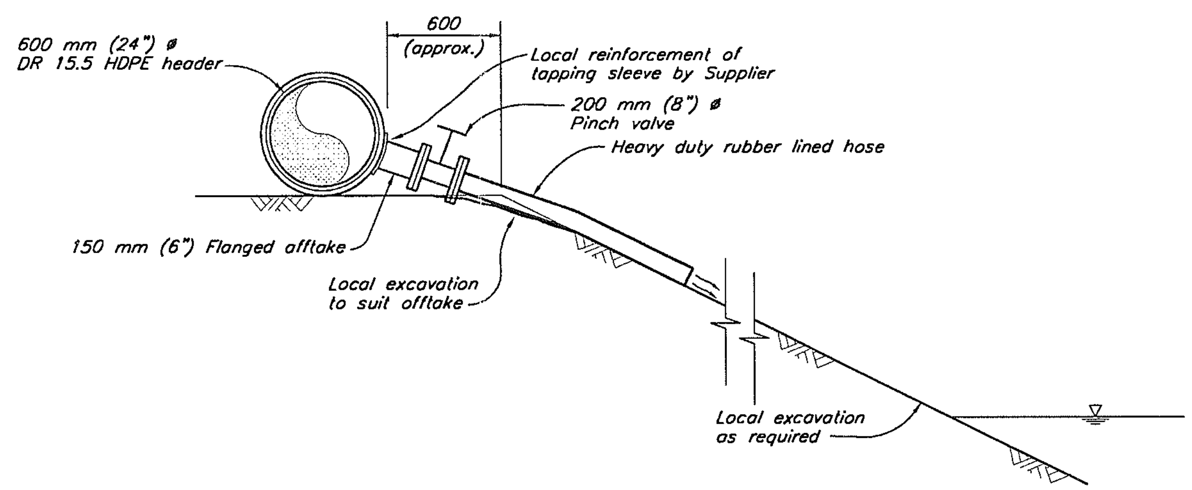
TYP. TAILINGS HEADER OFFTAKE
(MARK 2)
Scale A



TYP. TAILINGS HEADER OFFTAKE
WITH HEADER VALVE
(MARK 3)
Scale A



FULL DIAMETER TAILINGS PIPELINE TERMINATION
(MARK 4)
Scale A

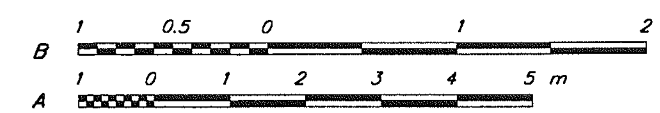


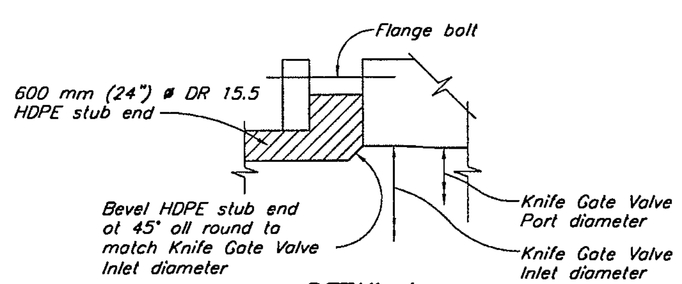
SECTION 1 (TYP. MARK 2 & MARK 3)
Scale B

NOTES

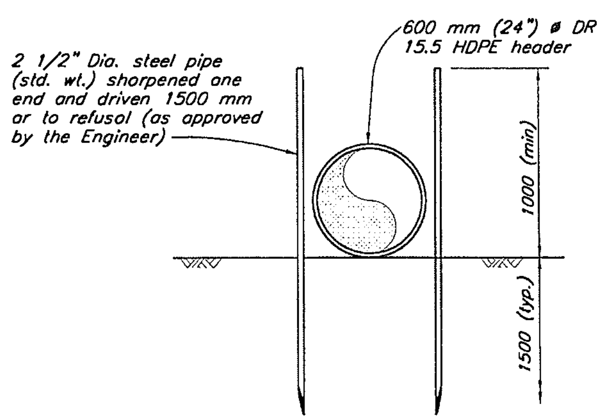
1. Lining to be Linatex PGR, urethane or approved equivalent.
2. Pipe restraint by local burial of pipeline concrete gravity anchors or as otherwise required by the Engineer to control movement due to thermal and hydraulic forces.
3. Robar 6626 c/w 1/4" rubber or urethane lining of offtake and external reinforcement of offtake to sleeve joint.
4. HDPE Pipe ID may exceed that of knife gate valve and is to be field bevelled to match if required.
5. HDPE pipelines to be connected under cool conditions with snaking allowance made for additional thermal contraction of empty pipeline.
6. Mark 2 and 3 offtakes to be added as required.

NOT FOR CONSTRUCTION

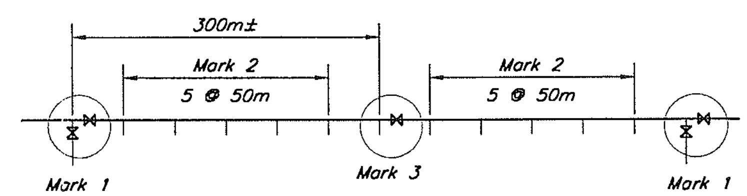




DETAIL A
KNIFE GATE INLET
(Note 4)
NTS



DETAIL B
GUIDEPOST
(see NOTE 2 for Alternative Anchor Suggestions)
Scale B



DETAIL A/310 A/311
SCHEMATIC PLAN OF DISCHARGE PIPEWORK
NTS

DRG. NO.	DESCRIPTION
313	TAILINGS PIPEWORK - PROFILES - SHEET 2
312	TAILINGS PIPEWORK - PROFILES - SHEET 1
311	TAILINGS PIPEWORK OPTIONS - FINAL STAGE - PLAN
310	TAILINGS PIPEWORK OPTIONS - STAGE 4 - PLAN

REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
B	09MAR'05	ISSUED FOR REPORT	HPD	LK		

REVISIONS

PROFESSIONAL ENGINEER H. P. DEW #11611 BRITISH COLUMBIA

Knight Piésold CONSULTING

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
TAILINGS PIPEWORK
DETAILS

PROJECT/ASSIGNMENT NO.	DRAWING NO.	REVISION
VA101-1/8	315	0

APPENDIX A

TAILINGS AND RECLAIM PIPELINES

(Pages A1 to A7)

APPENDIX A - TAILINGS AND RECLAIM PIPELINES

Design Criteria

The original tailings pipeline design was based on the following criteria:

- Design flow of 20,000 tonnes/day at 35% solids by weight at the mill. The effective solids content is periodically reduced by the introduction of surface runoff into the pipeline.
- Millsite tailings pipeline inlet elevation is 1,110 metres (approximately).
- TSF embankment crest elevation at end of mine life will be 965 m.
- Tailings pipeline has an average downhill grade of approximately 1.9% to the TSF, without high spots. This is more than sufficient for gravity discharge for the life of the project and to fully drain the line between the mill and TSF.
- Pipe diameter is designed for gravity flow including open channel flow, over a range of system throughputs and head requirements.
- Pipelines on TSF embankments are laid at zero grade. Provision is required to drain the pipeline through valved offtakes, or by disconnecting sections of the pipeline.
- Runoff from the millsite sump enters the tailings pipeline near the mill gate. Runoff from the Southeast Sediment Pond currently enters the tailings pipeline at the T2 drop box.

The tailings pipeline is provided with full-length spill containment. It is buried through the millsite area and is laid in a containment channel alongside the access road from the millsite to the TSF. The pipeline is laid on the inside of the crest of the TSF to direct any spillage into the facility.

As appropriate, a clean water diversion channel is installed up-slope of the pipeline and the containment ditch. This ensures that clean water can be bypassed around the facility.

Tailings Pipeline

The tailings pipeline comprises 7000 m of HDPE pipe of varying diameters and pressure ratings. It has a design flow of 20,000 tonnes/day at 35% solids by weight at the mill. The existing tailings pipeline includes two major sections, distinguished by different pressure ratings and inside diameters. The first, from the Millsite to the T2 Drop box comprises 22 inch (556 mm) DR 17 HDPE pipe. The second from T2 to the TSF and around the Perimeter and Main Embankments comprises 24 inch (610 mm) DR 15.5 HDPE pipe. Two short sections of 30 inch (762 mm) DR 15.5 HDPE pipe are located at the start of the two pipeline sections (at the Millsite and at the T2 Drop box) to ensure that flows are not restricted at the inlets.

The pipeline runs along the inside crest of the TSF embankment. It was provided with a single relocateable discharge section, approximately 100m long with flanges at either end, which included six, 150 mm offtakes. The line terminated with a 90-degree elbow, directed into the facility. Wherever it was installed, the movable discharge section allowed controlled deposition of tailings from an isolated section of the embankment. The line included flanged connections for the installation of the movable section. This arrangement was used as a capital cost saving measure as compared to the more conventional procedure of locating more valved off-takes along the pipeline. A typical off-take or “spigot” comprised:

- A strap-on tee sleeve (Robar type) on the tailings pipeline with a flanged 150 mm outlet;
- A 150 mm offtake pinch valve to regulate and balance the discharge flows and to close off the off-take when not in use;
- A short length of heavy-duty (material handling type) hose or HDPE pipe as a discharge pipe, anchored to the embankment to direct tailings flow and minimize erosion of the local embankment fill.

Where numerous off-takes are installed, a large diameter valve will normally be located downstream of each set of off-takes to confine the discharge of tailings to the required location. This valve also ensures that the downstream pipework does not fill and plug with tailings. It also allows pipe sections to be relocated or removed.

Provision for full pipe diameter discharge was also provided at the M1A dump-valve. A second dump valve assembly (M2A) was also available downstream of M1A. As the embankment was constructed without grade, every effort was required to maintain the takings delivery pipeline free of significant sags or high-points. Air trapped in the high-points and sand accumulated or water freezing in the low sections can severely impair or halt operation of the pipeline.

<u>Instrumentation</u>

A series of pressure tap stations, including pressure gauges and air bleed valves were installed in the tailings line between the T2 drop box and the TSF. A rupture disc assembly was located in the line in the vicinity of the M1A dump-valve

<u>Tailings Pipeline Operation</u>

Periodically the operation of the tailings line was accompanied by the intermittent violent ejection of air and tailings at T2, or by the backflow of tailings into T2. These events were mostly associated with the relocation of the point of discharge from the M1A dump-valve to discharge points further downstream in the pipeline.

The ejected air appeared to be air trapped in the pipeline when the line isolating valve was opened to move the tailings discharge point downstream from M1A. The problem was reduced by the periodic bleeding of air from the line through small valves located in the crown of the tailings line between T2 and M1A. A proposed design modification included the provision of a valved standpipe for air release, adjacent to the M1A isolating valve. It is not known if this was implemented.

Overflow of tailings at DB2 originated with partial blockages in the tailings on the embankment crest. These blockages most likely occur at low points in the pipeline or at locations, not completely drained when a length of pipe was previously taken out of service. Typically, additional pressure is required in the line to re-entrain and clear out such deposited material. Under some circumstances the required pressure could only be developed when the hydraulic grade line rose above that of T2, resulting in spillage. The potential for such spills can be reduced by ensuring that the line is free of low spots and immediately after it is take out of service, drained to the greatest extent possible.

Reclaim System

The reclaim water system returned water from the TSF to the millsite, for re-use in the process. The system comprises a pump barge, a reclaim pipeline and a reclaim booster pump station.

Design Criteria

The reclaim water system was designed to meet the following general criteria:

- Provide adequate pipeline and pumping capacity to meet operational requirements for process water.
- Operate over a pond water level elevation range of approximately 15 m before the system must be relocated.
- Include a booster pump-station at the approximate midpoint elevation between the tailings supernatant pond and the mill to reduce the system pressure rating.
- Include booster pumps identical to those at the supernatant pond, to reduce spare parts inventory and to simplify maintenance.
- Collect any leakage or spillage and direct it back into the TSF by laying the pipeline in a lined ditch.

Reclaim Pump Station

A reclaim barge was installed at the TSF. It comprised a prefabricated floating pump station complete with perimeter trash screens, internal wet well(s), pump(s), valving, piping, electrical power, instrumentation and control circuitry. The facility was designed and supplied by Chamco.

A hinged walkway and pipe bridge is provided for access to the barge from the side of the reclaim barge channel. The barge is currently located at the west end of the facility.

Reclaim Pipeline

The reclaim pipeline is constructed in two sections of nominal 24 inch (610 mm) HDPE pipe, with varying pressure ratings to accommodate anticipated operating pressures and vacuum conditions. The first section extends from the pump barge to the booster pump station. It initially included a stretch of steel pipe immediately downstream of the barge. This has since been taken out of service. The second pipe section upstream of the booster pump-station is similar to the first, but has no steel pipe component. The pipeline is laid alongside the tailings line, in the same lined trench.

Reclaim Booster Pump Station

The reclaim booster pump station is constructed as a covered concrete tank. It uses pumps similar to those on the pump barge and was also provided by Chamco. A control system co-ordinates pump operations with process water demand.

Tailings and Reclaim System Upgrades

Tailings System Upgrades

Proposed upgrades to the tailings pipeline will be designed to meet the following objectives:

- Recover and make maximum use of the existing pipework.
- Improve operability and discharge flexibility of the pipeworks.
- As soon as possible, provide the ability to deposit tailings from the south embankment, and to develop beaches sufficient to maintain the surface water pond clear of the south embankment.
- Enable simultaneous tailings deposition into the facility and embankment construction without using tailings dump valves.
- Minimize the requirements for high pressures in the tailings pipework.
- Accommodate known operating problems associated with air entrainment in the pipeline and its explosive escape through the vent pipes at DB2.
- Enable the existing tailings discharge system to continue to operate at 20,000 tpd with embankment raises up to and including a nominal elevation of 965 m.
- Consider alternatives in the event that mill throughput is significantly increased.

The following measures are proposed to upgrade the tailings discharge system:

Additional Tailings Pipeline

- Construct a new tailings pipeline across the west side of the facility and then over the crest of the South Embankment. This line will connect to the existing tailings line, to the north of the TSF at an elevation of not less than 970 m and be laid at a steady downward grade and terminate at elevation 966 m approximately, at the ultimate west abutment of the South Dam. From elevation 966 m the line will extend across the South Embankment to its east abutment. The extension of the tailings pipeline is shown on Drawing 310 and 311. Provision will be made for a dump line at the embankment and for multiple discharge points on the embankment.
- The pipeline, its associated access road and upstream diversion ditch, will be laid above the anticipated ultimate extent of the tailings beach and supernatant pond.
- The pipeline will be laid in a drainage ditch for spill containment and will be sleeved or contained in a culvert as required for road and stream crossings.
- The access road will have a clean water upstream diversion ditch to carry run-off from the upstream catchment, around the facility.

The new pipeline will enable tailings discharge from the South Embankment, which will ensure that the supernatant pond can be kept away from this embankment, thereby reducing the potential for seepage losses through and under the dam. Tailings placement from this embankment is also necessary to develop a good foundation for future embankment raises. The new pipeline will also enable embankment construction to continue on the Perimeter and Main Embankments without the need to maintain the pipe-work in place for coincident tailings deposition.

The only alternative for tailings deposition from the South Embankment is to extend the existing line westward from the Main Embankment. This is not practical, as it will require upstream operating pressures in the existing tailings pipeline that exceed the pressure capability of the existing pipework. It would also require pipe-work be maintained in place over the Perimeter and Main Embankments while they undergo embankment raises.

Increased Mill Throughput

In the event that mill throughput is increased marginally say (10%) the capacity of the existing tailings pipeline, and the proposed extension can also be increased marginally. This could be achieved by permanently removing the connections for storm drainage into the pipeline both at the mill-site and at DB2. If this is done a new water discharge line will be required from the mill to the TSF.

With a significant increase in mill throughput (say by 50% to 30,000 tpd) the required velocity and pressures will significantly exceed the capacity and pressure rating of the existing tailings pipework. It would be necessary either to replace the existing tailings pipeline with one of larger diameter (probably 30”) and higher pressure rating to carry the entire flow, or else to install a second smaller diameter line (probably 18”) designed to carry the increased throughput.

Future Pipeline Discharge Offtakes

The most efficient use of the TSF is made when tailings can be evenly distributed from around the perimeter of the facility and when the discharge location can be easily and systematically relocated. The development of tailings beaches around the perimeter of the facility keeps the supernatant pond clear of the embankments, thereby increasing seepage paths and limiting seepage loss from the facility. Beached tailings when left to drain and consolidate form the competent foundation needed for the modified centreline construction of embankment raises.

Design will include for permanent groups of 4 to 6 smaller diameter valved offtake “tees” in the tailings pipeline, with a full diameter valve downstream of each group of tees. (At closure only a single such offtake group was in use and it was required to physically relocate this as required. The new pipeline across the south embankment would immediately equipped with such offtakes. The existing pipeline could be progressively retrofitted over several years.

A number of full diameter tee offtakes will also be included in the system to enable pipeline flushing, “emergency” discharge, or more rapid and concentrated local discharge of a significant volume of tailings.

As an economy measure, it is possible to install tees with flanged offtakes on the pipeline, at any number of locations. These can be capped with blind flanges. The flanges can be removed for discharge and then later replaced. Alternatively a smaller number of valves can be supplied for offtakes and periodically relocated, as required. In the long run, the labour time and cost involved in flange removal and replacement, and valve relocation will be significant. The provision of more valves is often the best way forward.

When discharging is occurring through a group of smaller diameter offtakes the slurry velocity in the distribution pipeline drops downstream of each offtake. Settling of solids can be a problem. Provided these settled solids are not left in place too long or allowed to freeze, they can normally be dislodged/re-entrained by increasing the slurry volume and velocity through the affected section of pipe. This occurs when discharge is moved further downstream in the header. Another way to minimize this is to discharge the tailings through off-takes in the pipe invert. This is a more difficult and complex design and requires supporting the header off the ground or excavating under it at each offtake. A further alternative is to discharge into the facility only through a single, full diameter offtake.

Flat Embankment Gradients and Consequences

The embankment gradient is flat and the pressure in the pipeline increases moving upstream – against the flow of tailings - to provide the head required to overcome friction. All valves and fittings in the pipeline must be selected with pressure ratings sufficient for the maximum expected line pressure when they are closed and not just for the relatively low pressure that exists when they are discharging.

Free drainage of the pipeline is also difficult with a flat embankment. Full diameter offtakes can facilitate this. Pipelines need to be laid without low or high spots and operated such that initial trapped air can escape. A large diameter connection to the reclaim pipeline may also be beneficial to allow for flushing of the tailings pipeline. This could be a connection located close to the reclaim barge or at the booster pump-station. Pressure control would be required to ensure the reclaim pumps did not over-pressurize the tailings line.

Typical pipework details are shown on Drawings 310, 311, 312, 313 and 315.

Reclaim System Upgrades

No specific upgrades are planned for the reclaim system.

In the event of a major increase in mill throughput it may be necessary to add additional pump horsepower, upgrade the existing line, or add a new line for the increased flow. However, if the system currently operates with low utilization, an increase in reclaim water demand might be met by increased utilization and if necessary by a marginal increase in existing throughput. If the additional capacity cannot be provided this way, upgrades to the existing line may be required. A brief study of the existing system operation, including flows and line pressures will be required.

A manual connection to the tailings line could be of assistance in the periodic flushing of settled solids out of the tailings pipework system.

APPENDIX B

SEEPAGE ANALYSES

TABLE B-1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

SEEPAGE ANALYSES MATERIAL PARAMETERS

Rev'd 3/2/2005
Printed 3/11/2005

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	Permeability (m/s)	Condition
Zone S	1.0E-09	
Zone C		
Zone B	1.0E-09	
Chimney Drain	N/A	
Dense Tailings	1.0E-08	El. < 934m
Coarse Tailings	7.0E-06	
Partially Consolidated Tailings	1.0E-07	El. > 946 m
	5.0E-08	El. 934-946 m
Loose to Medium Dense Till	1.0E-08	
Dense To Very Dense Till	1.0E-08	
Basal Till	1.0E-08	
Glaciolacustrine Sediments	1.0E-06	
Glaciofluvial Sediments	1.0E-06	
Till Liner	1.0E-08	

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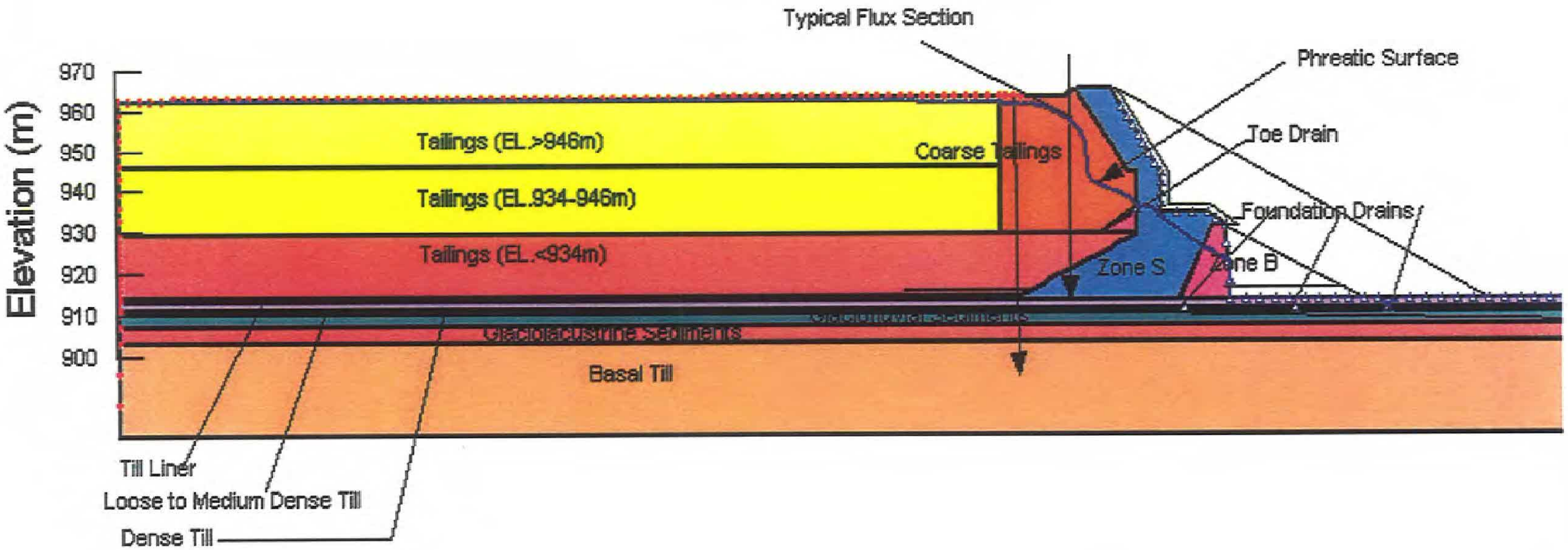

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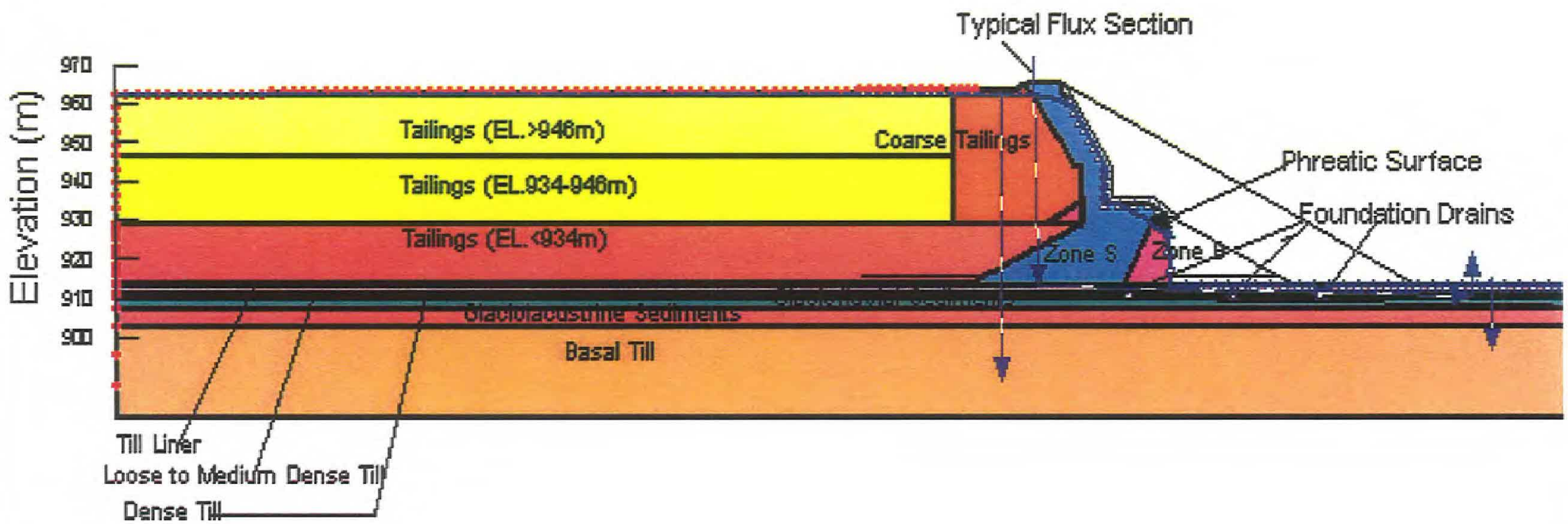
MOUNT POLLEY MINING CORPORATION			
MOUNT POLLEY MINE			
MAIN EMBANKMENT WITH TOE DRAIN TYPICAL SECTION FOR SEEPAGE ANALYSIS			
Knight Piésold CONSULTING	PROJECT/ASSIGN. NO. VA101-1/8	REF. 1	REV. 0
	FIGURE B1		



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MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

MAIN EMBANKMENT WITHOUT TOE DRAIN
TYPICAL SECTION FOR SEEPAGE ANALYSIS

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VA101-1/8	1	0

FIGURE B2

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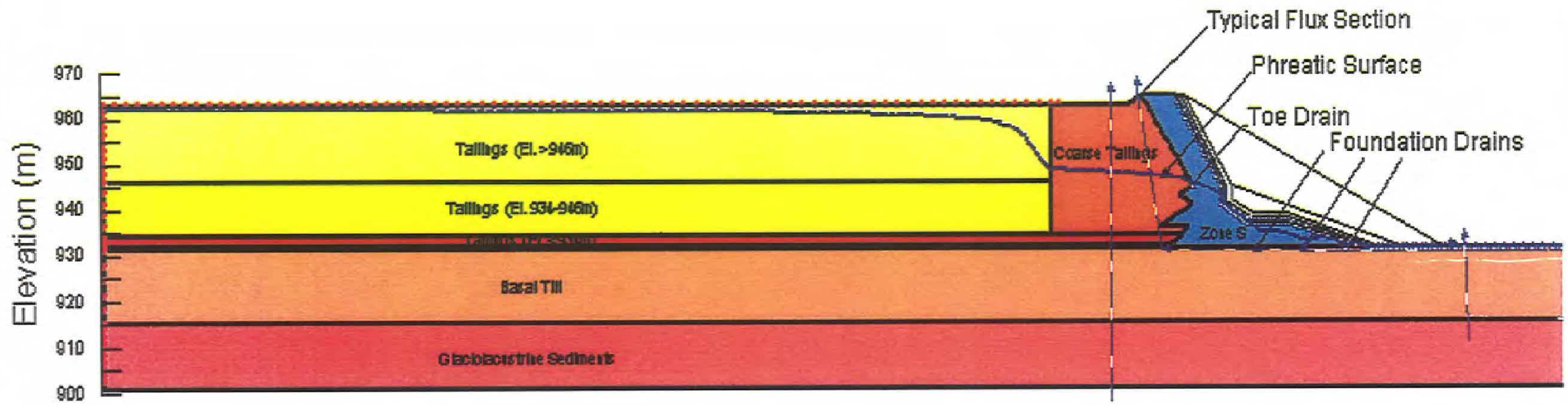
Rev'd 03/01/05



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MOUNT POLLEY MINING CORPORATION			
MOUNT POLLEY MINE			
PERIMETER EMBANKMENT WITH TOE DRAIN TYPICAL SECTION FOR SEEPAGE ANALYSIS			
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	FIGURE B3		

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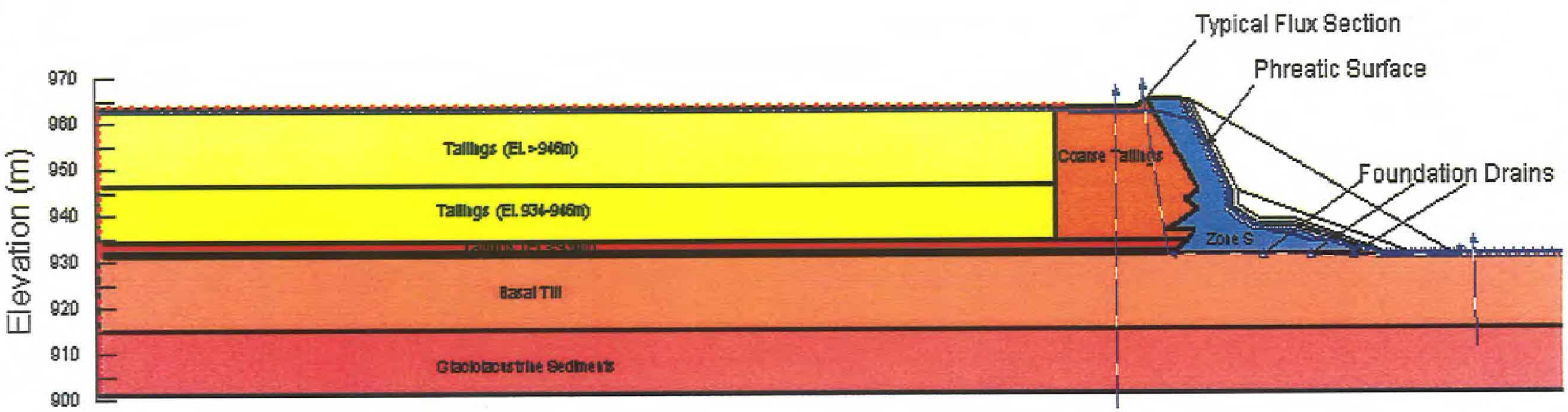
Rev'd 03/01/05



MOUNT POLLEY MINING CORPORATION			
MOUNT POLLEY MINE			
PERIMETER EMBANKMENT WITHOUT TOE DRAIN TYPICAL SECTION FOR SEEPAGE ANALYSIS			
Knight Piésold CONSULTING	PROJECT/ASSIGN. NO. VA101-1/8	REF. 1	REV. 0
	FIGURE B4		

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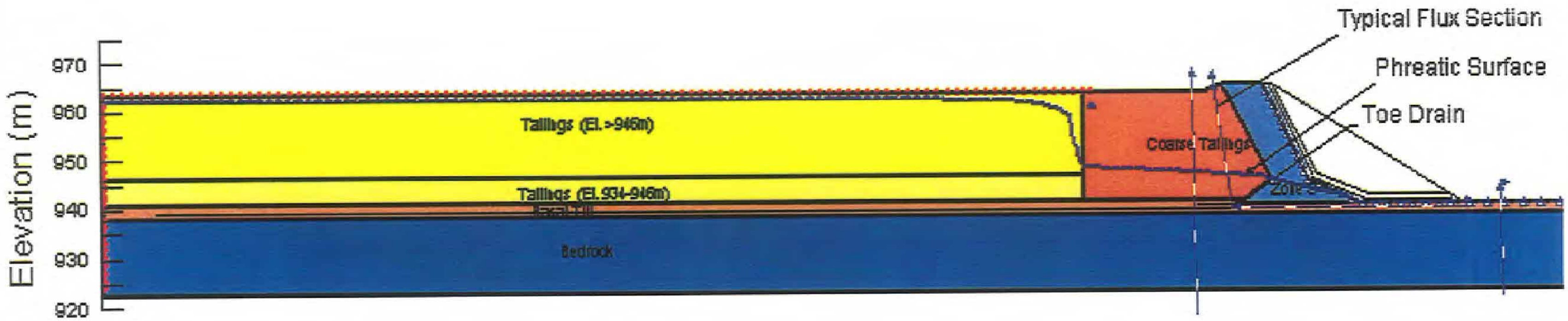

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

SOUTH EMBANKMENT WITH TOE DRAIN
TYPICAL SECTION FOR SEEPAGE ANALYSIS

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PROJECT/ASSIGN. NO.	REF.	REV.
VA101-1/8	1	0

FIGURE B5

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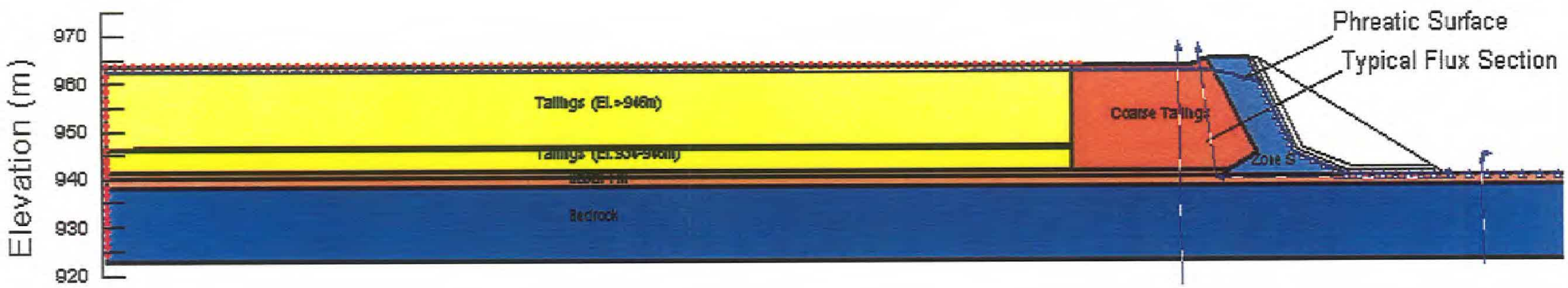

MOUNT POLLEY MINING CORPORATION		
MOUNT POLLEY MINE		
SOUTH EMBANKMENT WITHOUT TOE DRAIN TYPICAL SECTION FOR SEEPAGE ANALYSIS		
Knight Piésold CONSULTING	PROJECT/ASSIGN. NO. VA101-1/8	REF. 1	REV. 0
	FIGURE B6	

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APPENDIX C

STABILITY ANALYSES

TABLE C-1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

MINIMUM CRITERIA FOR DESIGN EARTHQUAKES

Consequence Category	Maximum Design Earthquake (MDE)	
	Deterministically Derived	Probabilistically Derived (Annual exceedence probability)
Very High	MCE[a][b][c]	1/10,000[b][c]
High	50% to 100% MCE[d][e]	1/1000 to 1/10,000[e]
Low	[f]	1/100 to 1/1000[f]

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[a] For a recognized fault or geographically defined tectonic province, the Maximum Credible Earthquake (MCE) is the largest reasonably conceivable earthquake that appears possible. For a dam site, MCE ground motions are the most severe ground motions capable of being produced at the site under the presently known or interpreted tectonic framework.

[b] In Hydro-Quebec's practice, the MDE for Very High Consequence structures involves a combination of deterministic and probabilistic approaches that reflect current knowledge of seismo-tectonic conditions in Eastern Canada. Hydro-Quebec's deterministically derived MDE magnitude is the maximum historically recorded earthquake, increased by one-half magnitude, while their probabilistically derived earthquake has an estimated probability of exceedence of 1/2000.

[c] An appropriate level of conservatism shall be applied to the factor of safety calculated from these loads, to reduce the risks of dam failure to tolerable values. Thus, the probability of dam failure could be much lower than the probability of extreme event loading.

[d] MDE firm ground accelerations and velocities can be taken as 50% to 100% of MCE values. For design purposes the magnitude should remain the same as the MCE.

[e] In the High Consequence category, the MDE is based on the consequences of failure. For example, if one incremental fatality would result from failure, an AEP of 1/1000 could be acceptable, but for consequences approaching those of a Very High Consequence dam, design earthquakes approaching the MCE would be required.

[f] If a Low Consequence structure cannot withstand the minimum criteria, the level of upgrading may be determined by economic risk analysis, with consideration of environmental and social impacts.

TABLE C-2

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

STABILITY ANALYSES MATERIAL PARAMETERS

Rev'd 3/2/2005
M:\1\01\00001\08\A\Report\Report 1\Appendix C\[Table C-2.xls]Table C-2 Printed 3/11/2005

	Unit Weight (KN/m^3)	Phi (deg)	Cohesion (Kpa)	Su / P'
Zone S	22	35	0	
Zone C	22	40	0	
Zone B	22	35	0	
Chimney Drain	20	35	0	
Dense Tailings (El. < 934)	18	30	0	
Tailings (El. >934)	18			0.3
Post Liquefaction Tailings	18			0.1
Coarse Tailings	19	30	0	
Loose to Medium Dense Till	21	26	0	
Dense To Very Dense Till	21	26	0	
Basal Till	21	33	0	
Glaciolacustrine Sediments	20	33	0	
Glaciofluvial Sediments	20	33	0	
Clay Liner	20	40	0	

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APPENDIX C1

SEISMICITY

(Pages C1-1 to C1-2)

APPENDIX C1 - SEISMICITY

Regional Seismicity

Mount Polley is situated in an area of historically low seismicity. The site is located within the Northern B.C. (NBC) source zone, close to the boundary with the Southeastern B.C. (SBC) source zone, as defined by Basham et al (1982). Basham assigns a maximum earthquake magnitude of 5.0 for the NBC zone. However, in March, 1986 a magnitude 5.4 did occur close to Prince George, approximately 200 km north-east of the project site. A maximum magnitude of 6.5 has been set for the SBC zone, based on historic earthquake data.

There has been much debate in recent years concerning the possibility of a large interplate earthquake of magnitude 8 or 9 along the Cascadia subduction zone. Such an event would be located at over 400 km west of the project site, and therefore ground motions amplitudes would be relatively low due to attenuation over such a large distance. However, the duration of shaking experienced at the site may be very long for such an event.

Southwest of the site lies the Northern Cascades region where a maximum earthquake magnitude of 7.5 has been estimated, based on historic seismic records and geologic data, (LaVassar, 1991). This potential source zone lies at a minimum distance of about 200 km and therefore is unlikely to have a significant impact at the site.

Seismic Design Parameters

A seismic hazard assessment for the site has been completed using both probabilistic and deterministic methods. Seismic ground motion parameters for both the Operating Basis Earthquake (OBE) and Maximum Design Earthquake (MDE) have been determined.

The probabilistic analysis was carried out by the Pacific Geoscience Centre based on the method presented by Cornell (1968). The results are:

Return Period (Years)	100	200	475	1000
Maximum Ground Acceleration (g)	0.021	0.028	0.037	0.046
Maximum Ground Velocity (m/sec)	0.043	0.056	0.077	0.094

Four potential source zones were considered for estimation of the maximum ground acceleration at the site for the deterministic analysis. These source zones are the Northern B.C., Southeastern B.C., Northern Cascades and Cascadia Subduction Zones. The results are tabulated below together with the maximum magnitude and estimated minimum epicentral distance for each zone:

Source Zone	Maximum Magnitude	Epicentral Distance,(km)	Maximum Acceleration, (g)
Northern B.C.	5.0	0	0.13
Southeastern B.C.	6.5	40	0.13
Northern Cascades	7.5	200	0.04
Cascadia Subduction Zone	9.0	450	0.08

The Northern B.C. magnitude 5.0 earthquake corresponds to a worst case event occurring directly beneath the site with a focal depth of 20 km. Maximum accelerations were calculated using the ground motion attenuation relationship given by Idriss (1993), using the Mean +1 standard error relationship. Based on this, a Maximum Credible Earthquake (MCE) of magnitude 6.5, causing a bedrock acceleration of 0.13 g has been assigned to the site.

The selection of appropriate design earthquakes is based on criteria given by the Canadian Dam Association's "Dam Safety Guidelines for Existing Dams". These criteria are given on Table C-1. A "HIGH" consequence category has been assessed for the Tailings Storage Facility during operations. For post-closure conditions a conservative "HIGH" consequence category has been adopted for design.

The seismic ground motions adopted and implications for design are summarized below:

The Operating Basis Earthquake (DBE) for operations will be taken as the 1 in 475 year return period event. This corresponds to a maximum firm ground acceleration of 0.037 g and maximum ground velocity of 0.077 m/sec. A design earthquake magnitude of 6.0 has been selected. These parameters will be used for the design of all earthwork structures.

The Maximum Design Earthquake (MDE) for the post closure condition of the Tailings Storage Facility has been conservatively taken as 50% of the MCE. This MDE corresponds to approximately the 1 in 2500 year return period event, based on extrapolation of data from the probabilistic analysis. This event gives a maximum firm ground acceleration of 0.065g and design magnitude of 6.5.

Due to the dense nature of the overconsolidated foundation soils at the site, the amplification of seismic waves as they propagate from bedrock to the ground surface will not be significant. Case studies have shown that ground motion amplification is negligible through dense soil deposits overlying bedrock. Therefore, maximum bedrock ground motion parameters have been used for embankment design.

APPENDIX C2

SLOPE/W ANALYSES

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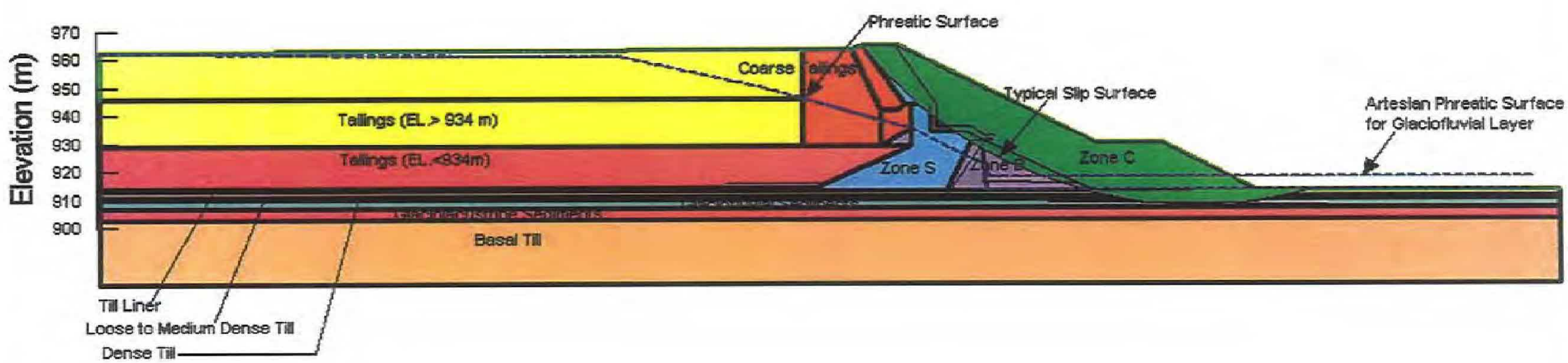

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

MAIN EMBANKMENT WITH TOE DRAIN
TYPICAL SECTION FOR STABILITY ANALYSIS

Knight Piésold CONSULTING

PROJECT/ASSIGN. NO.	REF.	REV
VA101-1/8	1	0

FIGURE C2-1

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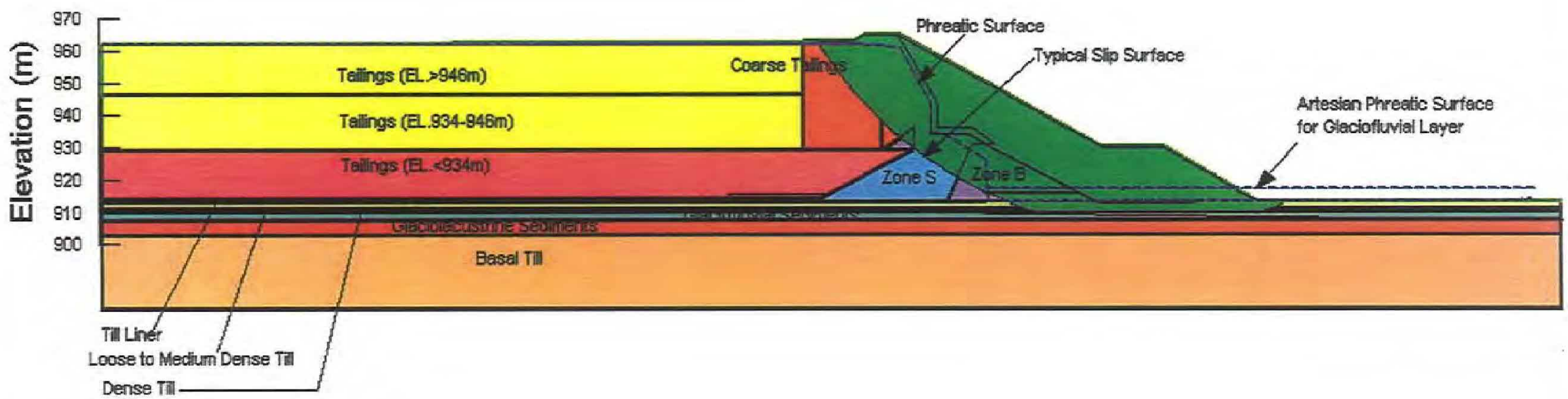

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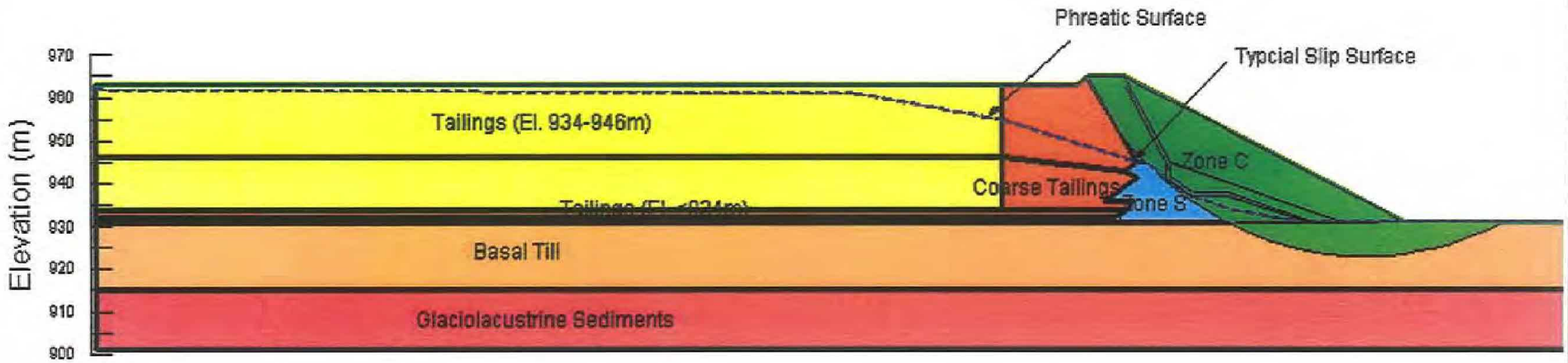
MOUNT POLLEY MINING CORPORATION		
MOUNT POLLEY MINE		
MAIN EMBANKMENT WITHOUT TOE DRAIN TYPICAL SECTION FOR STABILITY ANALYSIS		
PROJECT/ASSIGN. NO. VA101-1/8	REF. 1	REV. 0
Knight Piésold CONSULTING	**FIGURE C2-2**	



MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
PERIMETER EMBANKMENT WITH TOE DRAIN TYPICAL SECTION FOR STABILITY ANALYSIS

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PROJECT/ASSIGN. NO.	REF.	REV.
VA101-1/8	1	0

FIGURE C2-3

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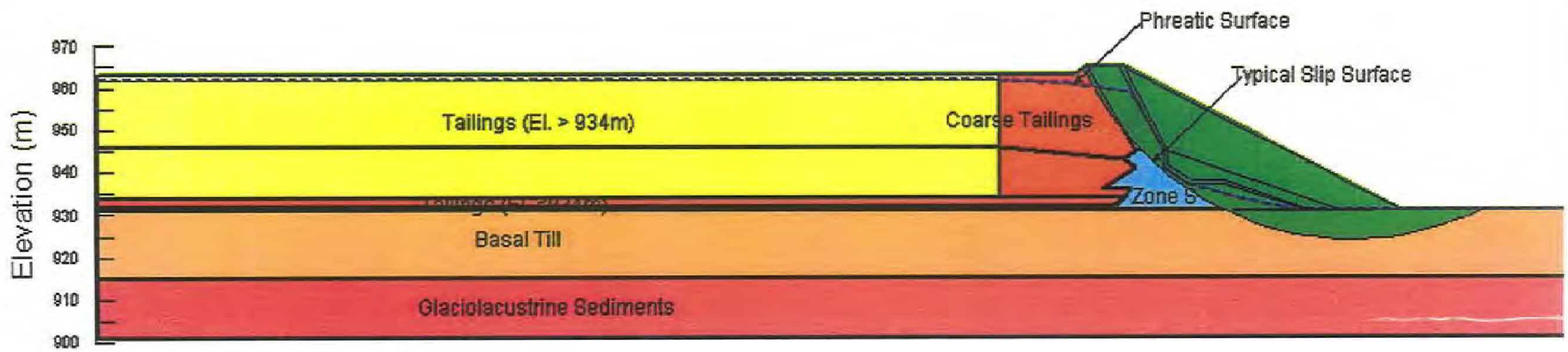
Rev'd 03/01/05



MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
PERIMETER EMBANKMENT WITHOUT TOE DRAIN TYPICAL SECTION FOR STABILITY ANALYSIS

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PROJECT/ASSIGN. NO.	REF.	REV.
VA101-1/8	1	0

FIGURE C2-4

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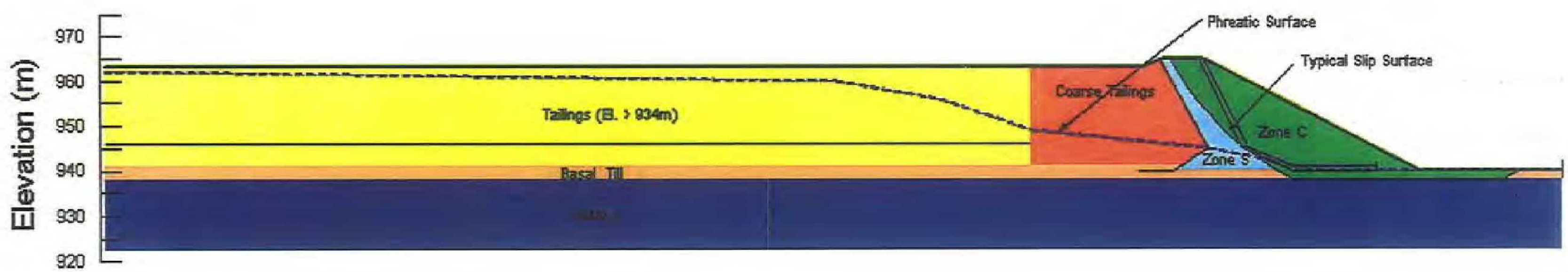

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
SOUTH EMBANKMENT WITH TOE DRAIN TYPICAL SECTION FOR STABILITY ANALYSIS

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PROJECT/ASSIGN. NO.	REF.	REV.
VA101-1/8	1	0

FIGURE C2-5

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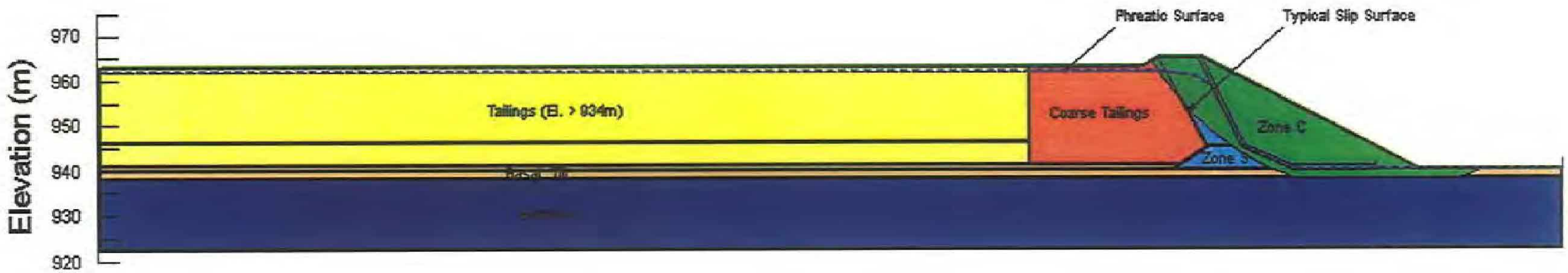

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

SOUTH EMBANKMENT WITHOUT TOE DRAIN
TYPICAL SECTION FOR STABILITY ANALYSIS

Knight Piésold CONSULTING

PROJECT/ASSIGN. NO.	REF.	REV.
VA101-1/8	1	0

FIGURE C2-6

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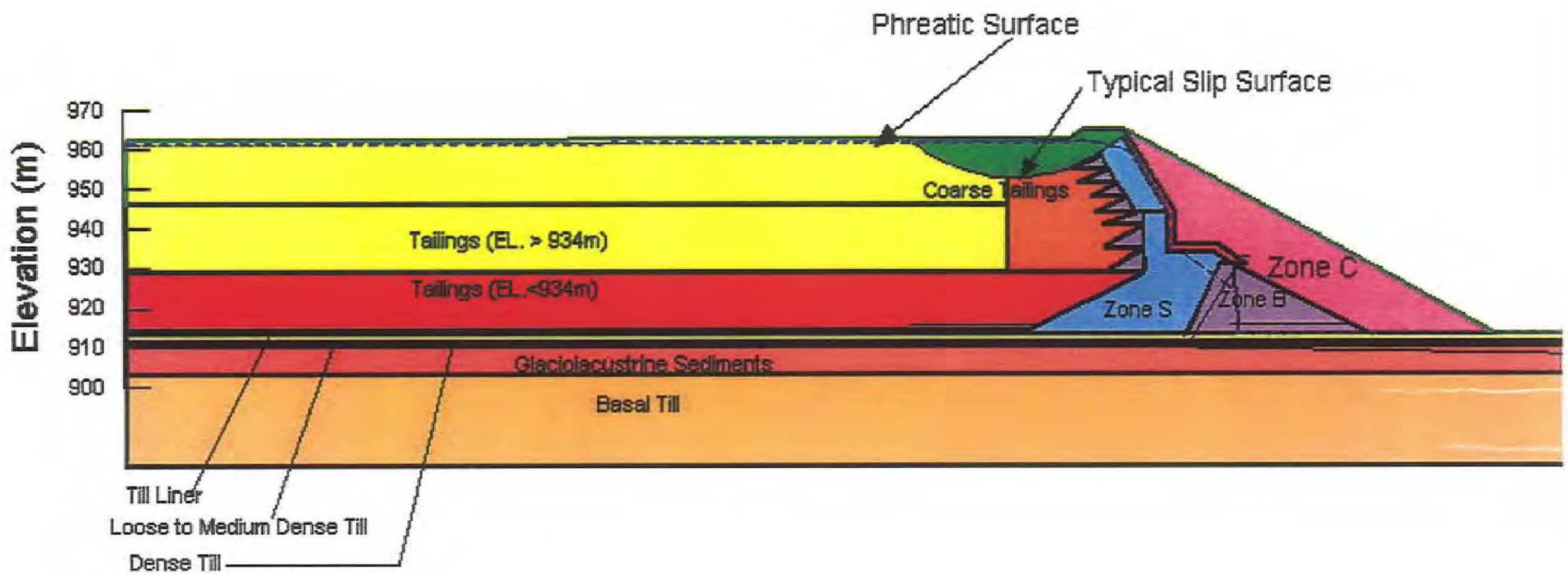

MOUNT POLLEY MINING CORPORATION			
MOUNT POLLEY MINE			
TYPICAL SECTION FOR UPSTREAM STABILITY ANALYSIS			
Knight Piésold CONSULTING	PROJECT/ASSIGN. NO. VA101-1/8	REF. 1	REV. 0
	FIGURE C2-7		

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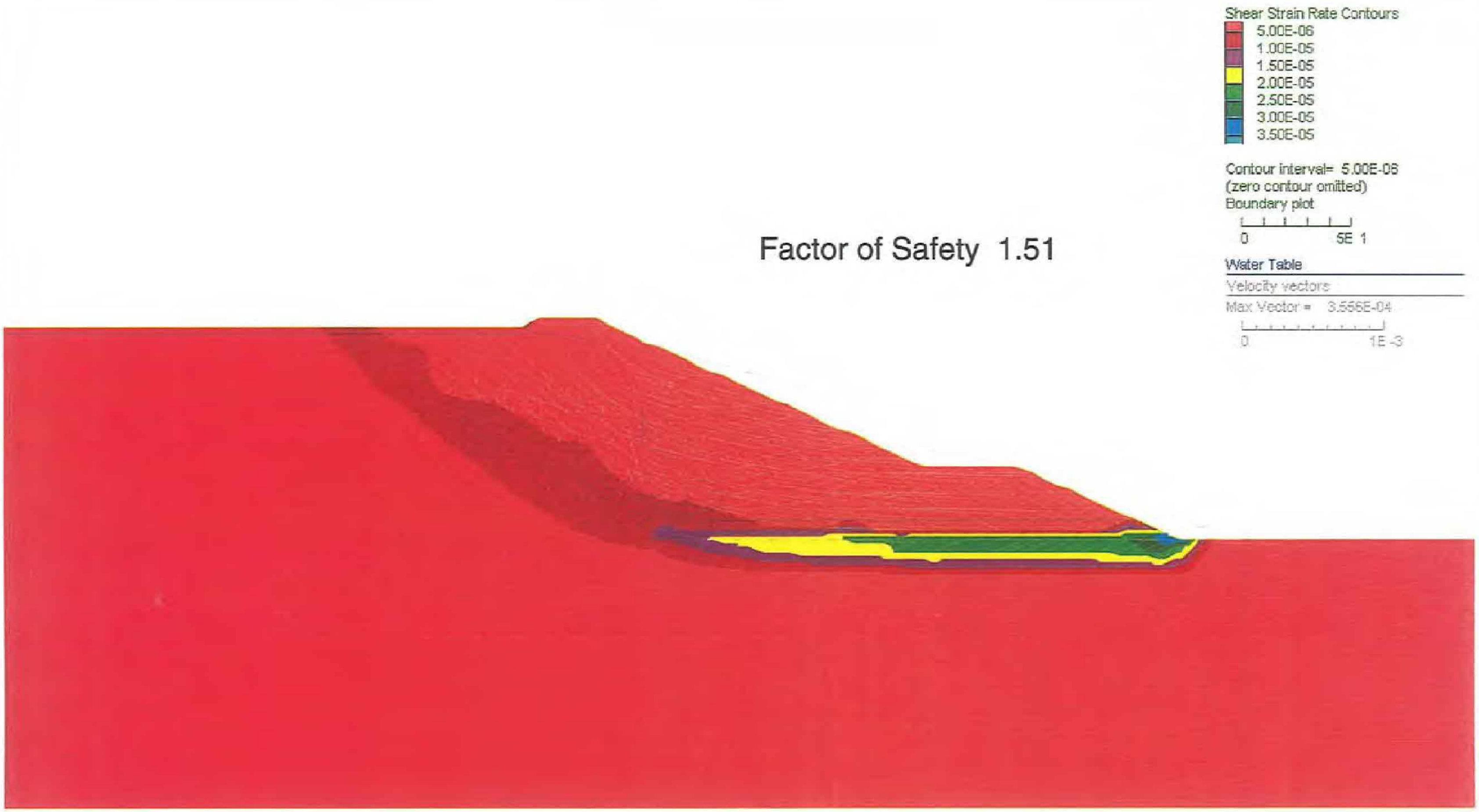
APPENDIX C3

FLAC/SLOPE/W ANALYSES



MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
FLAC/Slope STABILITY ANALYSIS STATIC STABILITY PLOT OF MAXIMUM SHEAR STRAIN

	PROJECT / ASSIGNMENT NO.	REF. NO.	REV.
Knight Piésold CONSULTING	VA101-1/8	1	0
	FIGURE C3-1		

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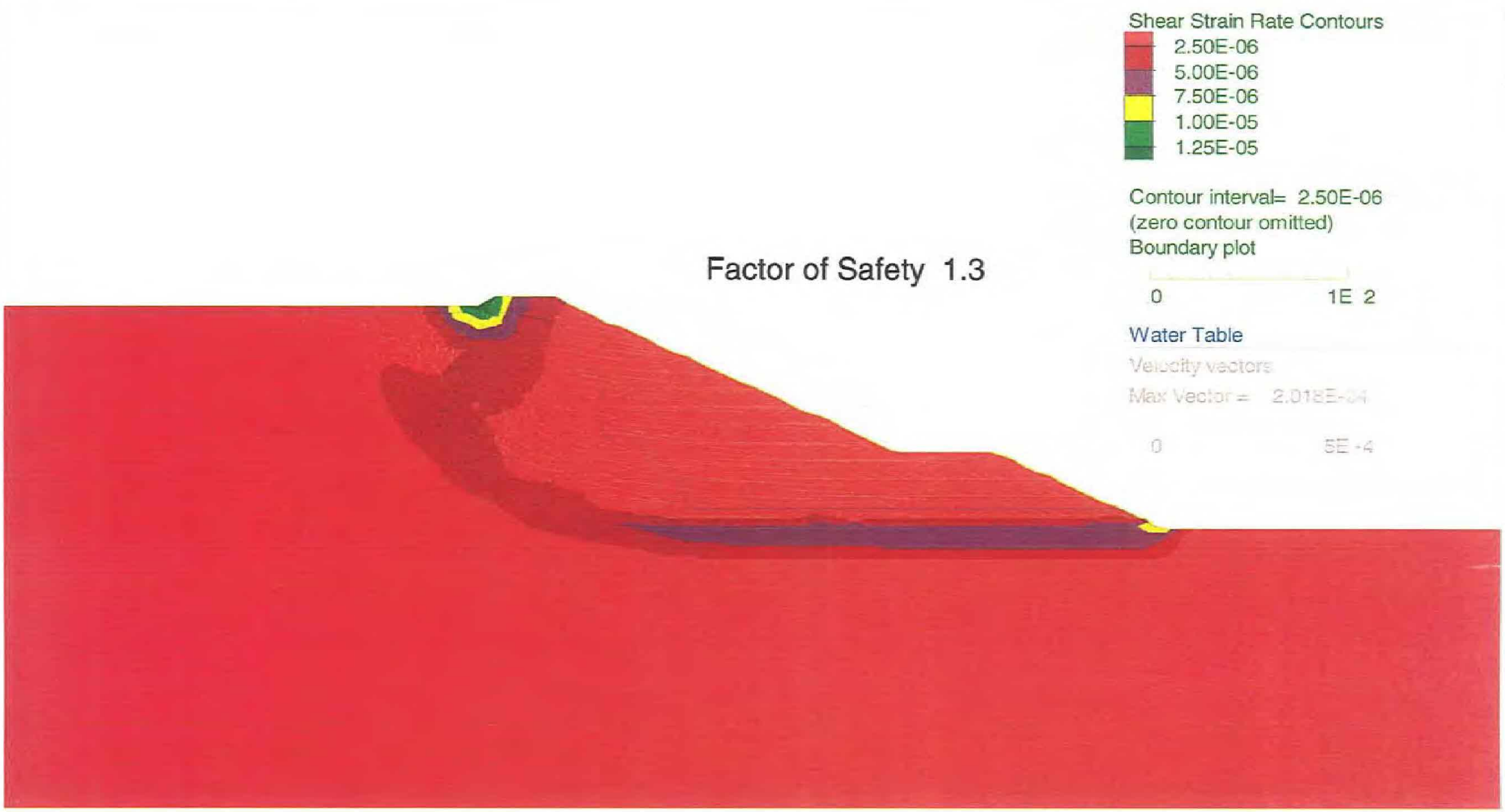

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
FLAC/Slope STABILITY ANALYSIS **STATIC POST-LIQUEFACTION STABILITY** **PLOT OF MAXIMUM SHEAR STRAIN**

Knight Piésold CONSULTING	PROJECT / ASSIGNMENT NO. VA101-1/8	REF. NO. 1	REV. 0
	FIGURE C3-2		

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APPENDIX D

MOUNT POLLEY WATER BALANCE

- Knight Piésold Ltd. Letter Report (Ref. No. VA101-1/6-A.01, V4-0816)
  (Pages D1 to D26)

- Tables D-1 Rev 0 Site Water Balance – No Discharge (Year 1 to Year 7)
  (Pages 1 to 7)

Knight Piésold Ltd. CONSULTING

Our Reference: VA101-1/6-A.01

Continuity No.: V4-0816

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July 30, 2004

COPY

Mr. Brian Kynoch
Mount Polley Mine
Imperial Metals Corporation
200 - 580 Hornby Street
Vancouver, B.C. V6C 3B6

Dear Brian,

Re: Mount Polley Water Balance

We have developed a water balance for the Mount Polley Mine Site as requested.

1.0 INTRODUCTION

A water balance has been developed for the Mount Polley Mine Site to aid in water management planning and to predict water surplus or deficit volumes after the resumption of operations in 2004. This water balance updates an earlier water balance by adding new development areas (including Springer Pit, Wight Pit, and the Northeast Rock Disposal Site (RDS)), updating precipitation estimates, and modifying other aspects of the balance to match the new mine plan.

The water management plan includes the following objectives:

- To effectively manage the water to minimize the need for regulated discharges to surface water and prevent the need for water removal from Polley Lake.
- To capture and manage all water that has been affected by mine components.
- To divert runoff from undisturbed areas away from the mine site and tailings facility (TSF).
- To store some excess TSF water to be used to accelerate pit filling at closure.
- To drain the TSF at closure by routing the water into the open pits.

Linked water balances have been completed for the assumed 7 years of mine life. The base case water balance assumes average precipitation conditions, a tailings dry density of 1.4 tonnes/m^3, and no discharge of water from the seepage pond.

2.0 WATER MANAGEMENT

Careful water management at the site will ensure that the discharge of TSF water will be minimized and that the removal of water from Polley Lake will not be required. Table 1 summarizes the water management timeline used for the water balance.

For average precipitation conditions a surplus of water will be produced on the site. Water reporting to the Tailings Storage Facility (TSF) includes precipitation and runoff from the TSF catchment, runoff from mine disturbed areas including Rock Disposal Sites (RDS), and groundwater from some of the open pits.

During Years 1 to 3 the Wight and Bell Pits are being developed. All runoff and groundwater from these pits will be directed to the TSF. In addition, water from the Cariboo Pit (500,000 m^3/year for 3 years) will be pumped to the TSF for storage to facilitate mining of the Bell Pit and to make room for the placement of waste rock from the Bell and Springer Pits into Cariboo Pit. "Clean " waste from the Bell Pit will be placed in the North RDS. During Year 2, development of the Springer Pit will commence, adding that pits runoff and groundwater to the tailings facility. At Year 3, the maximum water surplus will occur (approximately 1.5 million m^3 for the base case) as the Wight and Bell Pits are completed and the Northeast Rock Disposal Site (RDS) is fully developed. It is assumed that the maximum groundwater inflow for the pits will occur once the final pit depth is reached in Year 3 and the maximum runoff from the Northeast RDS will also occur in Year 3 once runoff from the entire area is captured and directed to the TSF.

After Year 3, the Wight Pit will be allowed to fill with water. Runoff and groundwater from this pit will therefore no longer be directed to the TSF but will be allowed to accumulate in place. Runoff from the Northeast RDS will be directed to the Wight Pit in Year 4 to accelerate pit filling. Also during Year 4, the Northeast RDS will be reclaimed and the runoff from this area will be released to the environment in subsequent years.

Development of the Springer Pit and North RDS will continue to Year 7. "Clean" waste rock from the Springer Pit will be placed in the North RDS. Runoff from this area is not captured. Other waste from the Springer Pit will be backfilled into the Cariboo and Bell Pits. Water will continue to be pumped from the Cariboo Pit to the TSF until Year 3 to increase the pit's storage capacity for waste rock. Between 1.5 and 2 million m^3 of water will be allowed to remain in the Cariboo Pit to fill the voids in the rock pile. Runoff and groundwater from the Bell Pit will be allowed to accumulate in the Bell Pit to fill the voids in the waste rock. It is expected that an equilibrium will be established over time. Runoff and groundwater from the Bell Pit will no longer contribute to the TSF volume after Year 3. Runoff and groundwater from the Springer Pit will report to the TSF for the life of the mine.

When development ceases in Year 7, the TSF will be drained by pumping the water to Springer Pit to accelerate pit filling.

Another iteration of the water balance was conducted assuming that the seepage, groundwater, and surface runoff that collects in the seepage pond were discharged. Approximately 400,000 m^3 of water was assumed discharged per year. A discharge of 2,000 m^3/day (or approximately 700,000 m^3) is allowed in Mount Polley's present permit for the care and maintenance period. This discharge allowance is no longer valid once operations resume but it may be beneficial to pursue the extension of the discharge permit for during operations. Water quality monitoring of the seepage pond by Mount Polley staff reports consistent water quality from during operations to the present at levels well below those in the present permit. If discharge through the seepage pond were to continue throughout operations, the volume of stored water in the TSF would be reduced, increasing the tailings beach and improving the stability of the facility. The discharge of good quality water would also help maintain the water levels in downstream waterways.

The water balance, including inputs and assumptions, is described in the following sections.

3.0 PROJECT COMPONENTS

The water balance includes water reporting to the main mine components including the open pits, rock disposal sites (RDS), the mill site, and the tailings facility. Figure 1 illustrates the main mine components and watershed areas. The assumed development sequences used for the project water balance are summarized in Tables 2, 3, and 4 for the Tailings Storage Facility (TSF) development, Open Pit development, and Rock Disposal Site (RDS) development.

4.0 HYDROMETEOROLOGY

PRECIPITATION

Precipitation estimates used for the model are presented in Table 5.

Mean annual precipitation for the site was estimated at 740 mm. This value reflects data collected at an on-site weather station and updates a previously estimated mean annual precipitation value of 755 mm used for previous work. Site data was available for May 1997 to December 2003. Precipitation data for the 1997 to 2002 period was available for Horsefly Lake Gruhs Lake and Barkerville, two climatologically similar stations in the area. Average annual precipitation values for the 1998 to 2002 period for the site and nearby stations are presented in Table 6. Also in Table 6 are the long-term average annual precipitation values for Horsefly Lake Gruhs Lake and Barkerville which were used to estimate long term average annual precipitation values for the site. The Horsefly Lake Gruhs Lake station is closer to the Mount Polley site and considered to be more representative of site conditions so the estimate for average annual precipitation generated with this station's data was chosen to represent the site.

A comparison of average monthly precipitation data for the three sites for the 1997 to 2002 period is shown graphically in Figure 2. Figure 3 compares the average monthly % of annual precipitation for these sites. The general pattern for monthly precipitation is similar for all three sites with the exception of the February data. The Mount Polley site data shows an increase in precipitation in February followed by a decrease in March while the other stations show a decrease in precipitation in February. The February Mount Polley site data is considered to be anomalous and the precipitation pattern for the site is assumed to mirror the other stations in the area. Again the Horsefly Lake Gruhs Lake station was chosen to represent the site. Monthly precipitation data for the Horsefly Lake Gruhs Lake station is presented in Table 7 for that station's period of record. The longer term average monthly % of annual precipitation values are also presented in Table 7 and are used for the Mount Polley water balance.

SNOWMELT

All snowfall at the site was considered to melt and contribute to runoff for the months of March to November. Snowfall between December and February was assumed to accumulate as snowpack. The accumulated snow was assumed to melt between March and May with 10% of the snowpack melting in March, 50% in April, and 40% in May. These assumptions were refined by Mount Polley staff based on observations at the mine site.

EVAPORATION

Evaporation data for the site was collected between 1997 and 2003 and is presented in Table 8. This data was compared to the site precipitation data for the same period to see if a correlation between evaporation and precipitation could be developed. No correlation was found for these parameters as illustrated in Figure 4, which plots evaporation against precipitation. The site data was found to closely match the estimates used in previous work so these were maintained for the current water balance.

RUNOFF COEFFICIENTS

Runoff coefficients were developed and calibrated by Mount Polley site staff based on observation and careful record taking on site from 1997 to 2003. Three sets of runoff coefficients were used for the water balance as presented in Table 9. The general runoff coefficients were used for the months of November to February and are estimates from the MTC Drainage Manual – Design Flood Estimates for Small Watersheds (MTO 1984). Freshet runoff coefficients were used for the months of March, April, and May. It was observed that runoff during these months, when the ground was either frozen (in the early period) or water saturated, was being under estimated by the general runoff coefficients for some catchment areas. Runoff coefficients for these areas were set to 100% for the freshet period. Conversely, during the dry summer and early fall months from June through October, it was observed that water from some areas (including the East RDS) was never reporting to the TSF or collection areas and was instead being absorbed into the dry ground or seeping out of the collection ditches. The runoff coefficients for these areas were set to zero for the dry period.

GROUNDWATER INPUT

Groundwater infiltration rates used for the water balance are presented in Table 10. The ultimate groundwater infiltration rate for Bell Pit once the final depth has been reached was estimated at 100 gpm or approximately 17,000 m^3/month. Bell Pit is already partly developed but has accumulated very little water (about 16 million gallons/3 years or 10 gpm) over the last 3 years. 100 gpm was chosen as a conservatively high infiltration rate. The ultimate infiltration rate for Springer Pit was estimated at 240 gpm or approximate 40,600 m^3/month. The ultimate rate for the Wight Pit was estimated at 450 gpm or 76,000 m^3/month because of its proximity to Polley Lake. The infiltration rates used in the water balance can be refined by comparison to pumping rates from the pits once operations resume.

The groundwater inflow to the open pits is assumed to relate to pit depth and therefore to development time. Yearly groundwater inflow rates were estimated using a linear relationship between inflow rate and time. Groundwater infiltration is assumed to be 0 until pit development starts and reaches its ultimate rate in the year development of the pit is concluded.

The Cariboo Pit is already storing water at year 0 so no groundwater infiltration is included for this pit. It is not known if infiltration to or seepage from the pit is actually occurring. The Wight and Bell Pits, which are allowed to flood, are assumed to have a constant groundwater infiltration rate (the ultimate rate) once pit development has finished. In reality, as the pit fills, the groundwater infiltration rate will decline as the seepage gradient into the pit reduces. The final storage volumes for these pits are therefore conservatively high.

5.0 WATER BALANCE RESULTS

BASE CASE OPERATIONS OPTION

The overall water balance is illustrated schematically in Figure 5 with results presented for Years 1, 3, and 7. Year 3 is included because the maximum water surplus is experienced during this year. General assumptions used for the water balance are summarized in Table 11.

By the end of Year 7 approximately 7 million m^3 of water will be stored in the TSF. At closure this water will be routed to the Springer Pit, which will have a capacity to store 18 million m^3 of water, to accelerate pit filling. Runoff from disturbed areas will also be directed to the Springer Pit until the areas are reclaimed. The Springer Pit will have a large storage capacity and will benefit from water inputs to accelerate the filling of the pit. At the end of Year 7 the Cariboo and Bell Pit wills be storing backfilled waste rock with approximately 3 million m^3 of water filling the voids between the rocks. Cariboo Pit has a capacity of approximately 6.2 million m^3 and the Bell Pit has a capacity of approximately 4.1 million m^3. A void ratio of about 30% is assumed. The Springer Pit will contain up to approximately 3.7 million m^3 of water. This is a conservatively high number as it assumes a constant infiltration rate as the pit fills.

It is estimated that approximately 2 million m^3 of storage capacity is available for each meter rise in the tailings pond level. If the TSF is storing 7 million m^3 of water as predicted by the water balance, a rise of about 3.5 m is expected. The increased pond level will result in a larger pond area with more of the beaches inundated by water. The beaches have an average slope of about 1% so water will extend across the beach approximately 350 m horizontally as the pond rises 3.5 m. Sufficient beaches will be maintained upstream of the embankments to prevent any stability concerns. The embankment crest elevation will be adjusted to maintain freeboard requirements for storage of the probable maximum precipitation (PMP) event plus 1 m for wave runup as required by the current permit.

DISCHARGE OPTION

A separate water balance has also been conducted which assumes that the existing water discharge permit is amended to also be applicable when operations recommence. The water balance with discharge assumed from the Main Embankment seepage recycle pond indicates that, approximately 4 million m^3 of water will be stored in the TSF as shown in Figure 6, which presents a schematic of the water balance for Years 1, 3, and 7. It may be beneficial to discharge water through the seepage pond to reduce TSF water storage requirements.

WET AND DRY CONDITION

Dry conditions have been experienced at the mine site in recent years. To ensure that sufficient water was available if a string of dry years were to occur over the mine lifetime, another iteration of the water balance was run assuming an annual precipitation of 595 mm for all 7 years of operations. Results from this model run are presented schematically in Figure 7 for Years 1, 3, and 7. At the end of Year 7, approximately 3.5 million m^3 of water is stored in the TSF indicating that enough water will be available throughout operations. It is extremely unlikely that the annual precipitation at the site will be constant at 595 mm for 7 consecutive years but this represents a worst-case scenario.

The @RISK risk analysis software was used to generate statistical estimates of minimum and maximum water volumes. The water balance was run using the @RISK program with monthly precipitation modeled as a normal distribution. The software used 1000 iterations of different precipitation conditions to generate minimum and maximum values for the water balance. Figure 8 presents the @RISK predictions for dry climatic conditions. An absolute minimum volume of approximately 4.5 million m^3 of water stored in the TSF is predicted for Year 7. Figure 9 presents the @RISK predictions for wet climatic conditions. An absolute maximum volume of approximately 10 million m^3 of water stored in the TSF is predicted for Year 7. Both the minimum and maximum values predicted by at risk are unlikely to occur. The 5% and 95% limits for dry and wet years are also illustrated in Figure 8.

Knight Piésold
CONSULTING

ADDITIONAL WATER SAVINGS

We understand that the Mount Polley Mine will continue to look at ways to further reduce fresh water inputs at the mine site by utilizing pit water to the extent possible. One possibility is to use pit water for the fresh makeup water required in the milling process. By using pit water instead of introducing additional fresh water to the system, approximately 2,000,000 m^3 of water can be prevented from entering the water balance. The TSF would then be storing 2,000,000 m^3 less water than presented in the current water balance.

We trust that this provides you with the information that you require. Please feel free to contact the undersigned if you have any comments or questions.

Yours very truly,
KNIGHT PIESOLD LTD.

Prepared by:

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Michelle Hasebe
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Reviewed by:

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Managing Director

Encl: Tables and Figures

cc: Art Frye

TABLE 1

MOUNT POLLEY MINING CORPORATION
MT. POLLEY PROJECT

WATER MANAGEMENT TIMELINE

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M:\1\01\00001\06\A\Data\water balance July 30\[Tables and Figures_rev 0.xls]Table 1_r0

Rev'd 7/30/2004

Year	
0	* Bell Pit is already partly developed. * Springer Pit has a small starter pit. * The East RDS is developed to it's ultimate surface area. * The North RDS is partly developed. * The Cariboo Pit is already storing water (2.5 million m^3).
1	* The Bell and Wight Pits are developed. Their ultimate surface area is disturbed. * Development starts on the Northeast RDS. * Waste from the Bell Pit is placed in the Cariboo Pit necessitating some water removal. * Water from the Cariboo Pit is pumped to the Mill and ends up in the TSF for storage (approximately 1.5 million m^3 over 3 years) * Surface runoff and groundwater from the Bell and Wight Pits is pumped to the Mill and ends up in the TSF.
2	* Development of the Springer Pit starts. The ultimate surface area is disturbed. * Development continues on Bell and Wight Pits. * Waste from the Bell and Springer Pits is placed in the Cariboo Pit necessitating some water removal. * Water from the Cariboo Pit is pumped to the Mill and ends up in the TSF for storage (approximately 1.5 million m^3 over 3 years) * Surface runoff and groundwater from the Bell, Wight, and Springer Pits is pumped to the Mill and ends up in the TSF.
3	*Development of Bell and Wight Pits is completed. * Development of the Northeast RDS is completed. * Waste from the Bell and Springer Pits is placed in the Cariboo Pit necessitating some water removal. * Water from the Cariboo Pit is pumped to the Mill and ends up in the TSF for storage (approximately 1.5 million m^3 over 3 years) * Surface runoff and groundwater from the Bell, Wight and Springer Pits is pumped to the Mill and ends up in the TSF.
4	* Development of the Springer Pit continues. * Filling of Wight Pit with water commences as groundwater and surface runoff is allowed to accumulate. * Runoff from the Northeast RDS is diverted to the Wight Pit to accelerate pit filling. * Waste from the Springer Pit is placed in the Cariboo and Bell Pits. * Reclamation of the Northeast RDS is initiated and finished by year end. * Surface runoff and groundwater from the Springer Pit is pumped to the Mill and ends up in the TSF. * Runoff and groundwater from the Bell Pit is no longer pumped to the TSF. Water is allowed to fill the voids in the waste rock.
5	* Development of the Springer Pit continues. * Runoff from the reclaimed Northeast RDS area is not collected. * Surface runoff and groundwater from the Springer Pit is pumped to the Mill and ends up in the TSF.
6	* Development of the Springer Pit continues. * Surface runoff and groundwater from the Springer Pit is pumped to the Mill and ends up in the TSF.
7	* Development of the Springer Pit is completed. * Development of the North RDS is completed. * Surface runoff and groundwater from the Springer Pit is pumped to the Mill and ends up in the TSF.
Closure	* The TSF is drained by pumping water to the Springer Pit, accelerating pit filling.

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<u>TABLE 2</u>

MOUNT POLLEY MINING CORPORATION
MT. POLLEY PROJECT
TAILINGS STORAGE FACILITY DEVELOPMENT

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M:\1\01\00001\06\A\Data\water balance July 30\[Tables and Figures_rev 0.xls]Table 2_r0 Rev'd 7/28/2004

END OF YEAR	AREAS (ha)				
	UNPREP'D BASIN	BEACH ONLY	POND	POND AND BEACH	TOTAL AREA
t=0	55	80	100	180	235
1	51	74	110	184	235
2	48	67	120	187	235
3	45	60	130	190	235
4	42	58	135	193	235
5	39	56	140	196	235
6	37	53	145	198	235
7	35	50	150	200	235

Notes: 1) Unprep'd Basin = Total Impoundment - Beach (incl. pond)
2) (Pond + Beach) areas for years 0 and 7 taken off the DAC Curve.

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TABLE 3

MOUNT POLLEY MINING CORPORATION
MT. POLLEY PROJECT
OPEN PIT DEVELOPMENT

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M:\1\01\00001\06\A\Data\water balance July 30\[Tables and Figures_rev 0.xls]Table 3_r0 Rev'd 7/28/2004

END OF YEAR	PIT CATCHMENT AREAS (ha)				TOTAL AREA (ha)
	Cariboo	Bell	Springer	Wight	
0	67	6	2	0	75
1	67	17	2	16	102
2	67	17	36	16	136
3	67	17	36	16	136
4	67	17	36	16	136
5	67	17	36	16	136
6	67	17	36	16	136
7	67	17	36	16	136

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TABLE 4

MOUNT POLLEY MINING CORPORATION
MT. POLLEY PROJECT
WASTE DUMP DEVELOPMENT

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YEAR	ROCK DISPOSAL SITES (RDS) CATCHMENT AREAS (ha)					
	EAST RDS		NORTH RDS		NORTHEAST RDS	
	DISTURBED	UNDIST'BD	DISTURBED	UNDIST'BD	DISTURBED	UNDIST'BD
0	55	89	5	11	0	0
1	55	89	7	9	15	21
2	55	89	9	7	26	10
3	55	89	11	5	36	0
4	55	89	13	3	36	0
5	55	89	14	2	0	0.0
6	55	89	15	1	0	0.0
7	55	89	16	0	0	0.0

Notes:

1. Assumes that the East RDS is not expanded beyond the present disturbed area. Both disturbed and undisturbed runoff is captured.
2. Assumes staged development of the North RDS over 7 years. Runoff from clean rock stored in the North RDS is monitored and released (not captured).
3. Assumes staged development of the Northeast RDS over 3 years. Only runoff from disturbed areas is captured.
4. Assumes the Northeast RDS is reclaimed by year 5 and the water is released. Runoff is routed into Wight Pit for Year 4.

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TABLE 5

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

PRECIPITATION AND EVAPORATION ESTIMATES USED FOR THE WATER BALANCE

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M:\1\01\00001\06\A\Data\water balance July 30\[Tables and Figures_rev 0 xls]Table 5_r0 Rev'd 7/30/2004

	% of Annual Precipitation[1]	Average Monthly Precipitation (mm)	Standard Deviation[3]	@RISK Monthly Precipitation (used for Model)	Snowfall[4]	Snowpack[4]	Evaporation[5] (mm)
January	8.6%	63.7	25	64	accumulates		0
February	5.1%	37.7	26	42	accumulates		0
March	4.1%	30.0	8	30	melts	10% melts	0
April	5.4%	40.1	23	42	melts	50% melts	0
May	7.4%	55.1	27	56	melts	40% melts	47
June	15.0%	111.2	38	111	melts		112
July	10.8%	80.1	32	81	melts		107
August	12.2%	90.6	44	93	melts		92
September	6.3%	46.6	19	47	melts		50
October	7.7%	56.9	20	57	melts		15
November	8.6%	63.9	33	66	melts		0
December	8.7%	64.0	30	65	accumulates		0
Average Annual Precipitation[2] (mm)	740			754			
Average Annual Evaporation[5] (mm)	423						

Notes:

1. % of Annual Precipitation estimates are based on long term records from the Horsefly Lake Gruhs Lake Station.
2. Site data was adjusted by comparison with long term records from the Horsefly Lake Gruhs Lake Station.
3. The standard deviation is assumed to be consistent with the Horsefly Lake Gruhs Lake long term data.
4. Assumptions regarding snowmelt were adopted from a previous water balance supplied by Mount Polley Mine.

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TABLE 6

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

AVERAGE ANNUAL PRECIPITATION

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	Average Annual Precipitation (mm)		
	Period of Site Record	Regional Long Term Average	Site Long Term Average
Mount Polley Site[1]	595	-	-
Horsefly Lake Gruhs Lake[2]	533	664	742
Barkerville[3]	960	1014	629
Likely[4]	na	701	-

Notes:

1. Data was available for the site from May 1997 - December 2003. The average annual value presented here is the average of 1998 - 2002 data.
2. Data for Horsefly Lake Gruhs Lake was available for approximately 20 years between 1950 - 2002 on the Environment Canada web site (http://www.climate.weatheroffice.ec.gc.ca/climateData/canada_e.html). Data was missing for a number of years.
3. Data for Barkerville was available for 1888 to 2002 on the Environment Canada web site. The site long term average value is from the Canadian Climate Normals 1971 - 2000.
4. Data for Likely was available for 1974 -1993 on the Canadian Daily Climate Data CD, Environment Canada. This station's period of record did not overlap with the site period of record so this station could not be used to estimate a long term average for the site.
5. Average annual precipitation values shown for the period of site record provide a comparison between the mine site and nearby weather stations but are not accurate average annual values because data was not available for several months. The averages are therefore based on incomplete data. Only months with data available at all sites were used in the calculation of annual averages for the period of site record values.

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TABLE 7

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

PRECIPITATION DATA FOR HORSEFLY LAKE GRUHS LAKE

Latitude: 52° 21' N   Longitude: 121° 21' W   Elevation: 777.00 m
Climate ID: 1093600

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	Average Monthly Precipitation												
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
1952	64.3	43.7	30.5	30.2	51.3	156.2	77.7	48	43.9	47	30.2	11.4	634.4
1953	73.7	21.8	40.1	109	33	118.6	70.1	104.1	44.5	81.5	31.8	42.7	770.9
1954	52.8	34.3	31.2	29	124	162.1	85.9	204	61.5	24.9	51.6	43.2	904.5
1956	41.9	85.1	32.5	16.3	29.7	140.2	57.7	93	34.8	40.6	29.2	93.2	694.2
1957	75.2	35.6	19.1	40.6	62.2	148.8	119.4	101.3	32.5	56.9	66.3	10.7	768.6
1958	72.4	42.4	29.2	19.3	11.7	89.9	4.3	30.2	62.7	21.6	20.6	59.2	463.5
1988	19.5	87.5	24	40.5	71.5	60	47	71.1	51.6	28.8	36.6	84.9	623
1989	80.1	18.6	24.9	12.1	58.2	60.2	71.4	137.8	18.6	46.4	113.2	73.2	714.7
1990	79.8	57.2	21.9	48.2	70.6	106.4	34.4	29.8	10.8	87.4	109.2	118.6	774.3
1991	31.2	25	40.4	22.6	13.6	77	103.2	65.8	45.8	72.2	57.6	52.2	606.6
1992	59.4	5.8	7.4	43.8	39.4	33.8	65.5	45	54.4	46.2	68.8	103.2	572.7
1993	40.4	4.8	32.8	50.4	70.8	104	57	102.4	11.2	42	44.8	44.6	605.2
1994	105.4	65.4	19.4	20.6	50	84.8	51	47.4	58.8	28.4	44.4	33.8	609.4
1995	27	16.6	25	50.2	35.2	73.8	94.8	108.4	30.2	71.8	99	52.4	684.4
1996	78.2	14.6	17.8	39	47.5	57.2	53	77.2	80.2	66.4	120	69.4	720.5
2000	53.2	8.4	30.2	14	47	122.4	95.6	53.8	36.2	60.2	26.2	53	600.2
2001	19.9	10.8	33.4	27.6	27.6	106.2	137.2	67	35.6	47.8	28.6	34.3	576
Average	57	34	27	36	50	100	72	82	42	51	58	58	666
% of annual	8.6%	5.1%	4.1%	5.4%	7.4%	15.0%	10.8%	12.2%	6.3%	7.7%	8.6%	8.7%	100.0%
Standard Deviation	25	26	8	23	27	38	32	44	19	20	33	30	

Note:
1. Years with missing or incomplete data were not used. Years with estimated values were used.
2. Estimated values.

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TABLE 8

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

MONTHLY EVAPORATION

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Monthly Evaporation													
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
1997	-	-	-	-	47	71	65.7	94.2	51.6	14.9	2.8	0	347.2
1998	0	0	0	0	40	139.9	143.4	144	59	16.7	0	0	543
1999	0	0	0	0	47	105.8	108.9	110	49	26.9	0	0	447.6
2000	0	0	0	0	64.3	105.5	107	92	50	15	0	0	433.8
2001	0	0	0	0	21.5	89.8	103.5	78.8	50	26	0	0	369.6
2002	0	0	0	0	47	98.3	107	92	43.3	22.5	0	0	410.1
2003	0	0	0	0	47	112	145	145	50	15	0	0	514
Average	0	0	0	0	45	103	112	108	50	20	0	0	438
KP Prediction 1995	0	0	0	0	47	112	107	92	50	15	0	0	423

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Notes:

1. Site data supplied by Mount Polley Mine.
2. The weather station was down so an estimate is reported.

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TABLE 9

MOUNT POLLEY MINING CORPORATION
MT. POLLEY PROJECT
RUNOFF COEFFICIENTS

Print 8/3/2004 9:43

M:\1\01\00001\06\A\Data\water balance July 30\[Tables and Figures_rev 0.xls Rev'd 7/28/2004

	Runoff Coefficients		
	General	Freshet	Dry Period
TSF Areas			
Unprepared Basin	0.35	1	0
Tailings Beach	0.9	0.9	0.9
Open Pit Areas	0.5	0.5	0.5
Undisturbed RDS Areas	0.24	1	0
Disturbed RDS Areas	0.60	1	0
Millsite Area	0.50	0.5	0.5
Downstream Tailings Areas	0.7	1	0
Undisturbed Catchment	0.24	0.24	0.24

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TABLE 10

MOUNT POLLEY MINING CORPORATION
MT. POLLEY PROJECT
GROUNDWATER INFILTRATION ESTIMATES

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#REF!

Rev'd 7/30/2004

	Groundwater Infiltration Estimates (gpm)		
Year	Bell	Springer	Wight
0	10	0	0
1	40	0	150
2	70	40	300
3	100	80	450
4	100	120	450
5	100	160	450
6	100	200	450
7	100	240	450

Assumptions:

* The Bell Pit is already partly developed. It has accumulated very little water over the last 3 years (approximately 16 million gallons or 10 gpm). A conservatively high value of 100 gpm is used for this pit's ultimate rate in Year 3. After Year 3 the rate is assumed to be 100 gpm although in actual fact infiltration will slow down as water fills the voids in the backfilled waste rock.

* The Wight Pit will be developed in Year 1. Its ultimate depth will be reached in Year 3. Its ultimate groundwater infiltration rate is assumed to be 450 gpm. After Year 3 the rate is assumed to be 450 gpm although in actual fact infiltration will slow down as the pit fills with water.

* The Springer Pit is developed in Year 2. Its ultimate depth is reached in Year 7. Its ultimate groundwater infiltration rate is assumed to be 240 gpm.

* Groundwater inflow to the pit is assumed to relate to pit depth, and therefore development time, so yearly inflow rates are estimated using a linear relationship between time and inflow rate.

* Groundwater inflitration is assumed to be 0 until pit devlopment commences and then estimated at 100 gpm for Bell Pit, 240 gpm for Springer Pit and 450 gpm for Wight Pit once they are fully developed.

* After Year 3 the Springer Pit and Bell Pit will start accumulating water and the groundwater will no longer effect the TSF volume.

* The Cariboo Pit is already storing water at Year 0. No groundwater infiltration is assumed for this pit as it is not know if infiltration or seepage is occurring.

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TABLE 11

MOUNT POLLEY MINING CORPORATION
MT. POLLEY PROJECT
GENERAL ASSUMPTIONS USED FOR THE WATER BALANCE

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M:\1\01\00001\06\A\Data\water balance July 30\[Tables and Figures_rev 0.xls]Table 11_r0

Rev'd 7/28/2004

Daily Ore Throughput (tpd)	17,808
Solids Content	35%
Tailings S.G.	2.65
Water Content of Ore	4%
Dry Density (t/m^3)	1.4
Initial Volume TSF (m^3)	2,500,000
Initial Volume Cariboo Pit (m3)	2,500,000
Intitial Volume Wight Pit	0
Initial Volume Bell Pit (m3)	75,000
Minimum Fresh Water Makeup	2.4%
Underdrainage Recovery - Back to TSF (m^3)	0
Groundwater Seepage Loss (m^3/month)	5,840
Total Groundwater and Seepage (m3/month)	35,355

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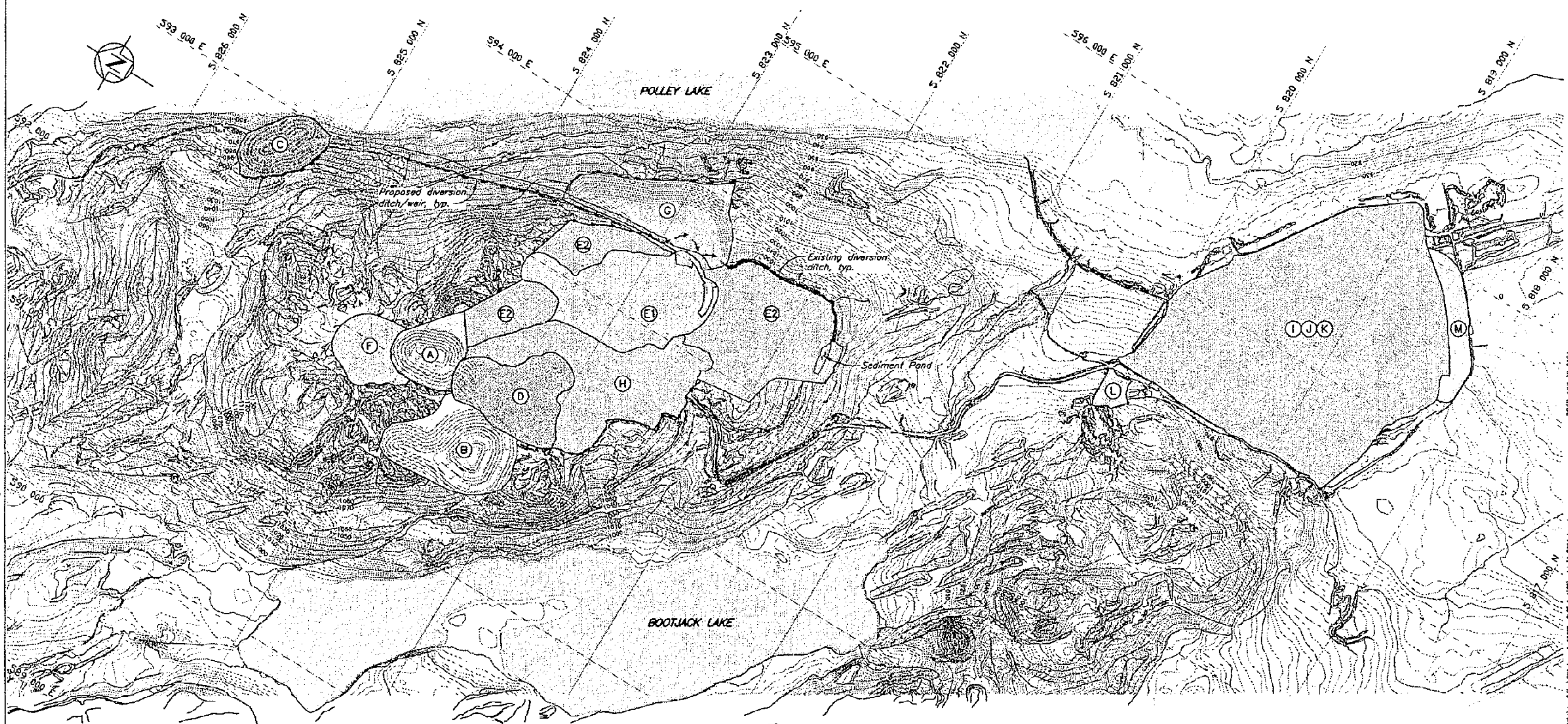
D-13



CATCHMENT AREAS IN WATER BALANCE FOR FINAL CONFIGURATION		
Catchment Area Description	*Area ID*	*Area (ha)*
PIT AREAS:		
Bell Pit	A	17
Springer Pit	B	36
Wight Pit	C	17
Cariboo Pit	D	31
ROCK DISPOSAL SITE (RDS):		
East RDS – Disturbed	E1	55
East RDS – Undisturbed	E2	86
North RDS	F	16
Northeast RDS	G	38
MILLSITE AREA	H	59
TAILINGS STORAGE FACILITY (TSF):		
Pond Area	I	
Beach Area	J	
Unprepared TSF Area	K	235
Biosolids Stockpile	L	4
Downstream Tailings Area	M	13

MOUNT POLLEY MINING CORPORATION		
MOUNT POLLEY MINE		
MINE COMPONENTS & WATERSHED AREAS USED FOR THE WATER BALANCE		
PROJECT/ASSIGNMENT NO. VA101-1/8	REF. NO. V4-0B16	REV. 0
Knight Piésold CONSULTING	FIGURE 1	

REV. 0 | ISSUED FOR CLIENT

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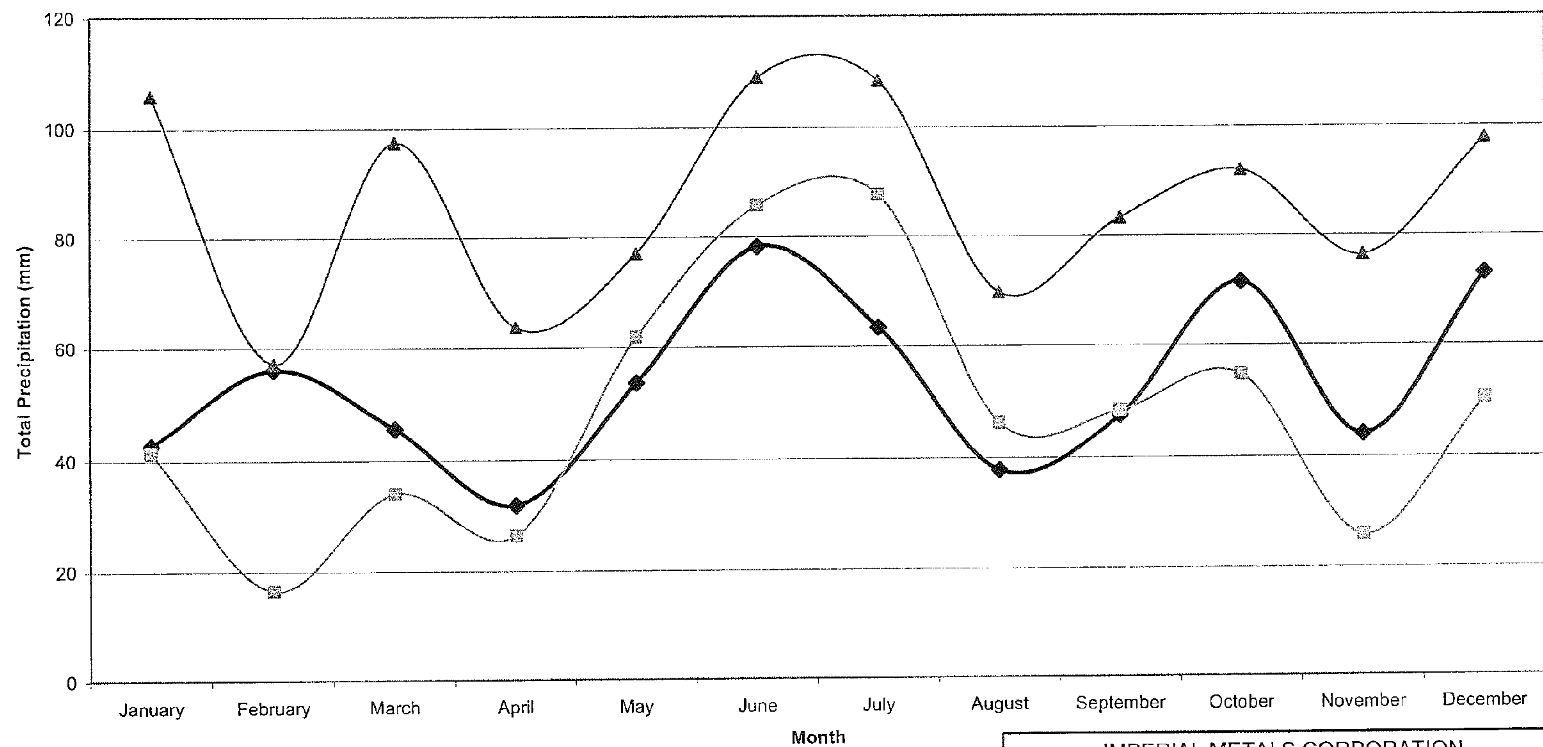

Measured Precipitation at Mine Site
Horsefly Lake Gruhs Lake
Barkerville

Note: 1. Site data supplied by Mount Polley Mine.

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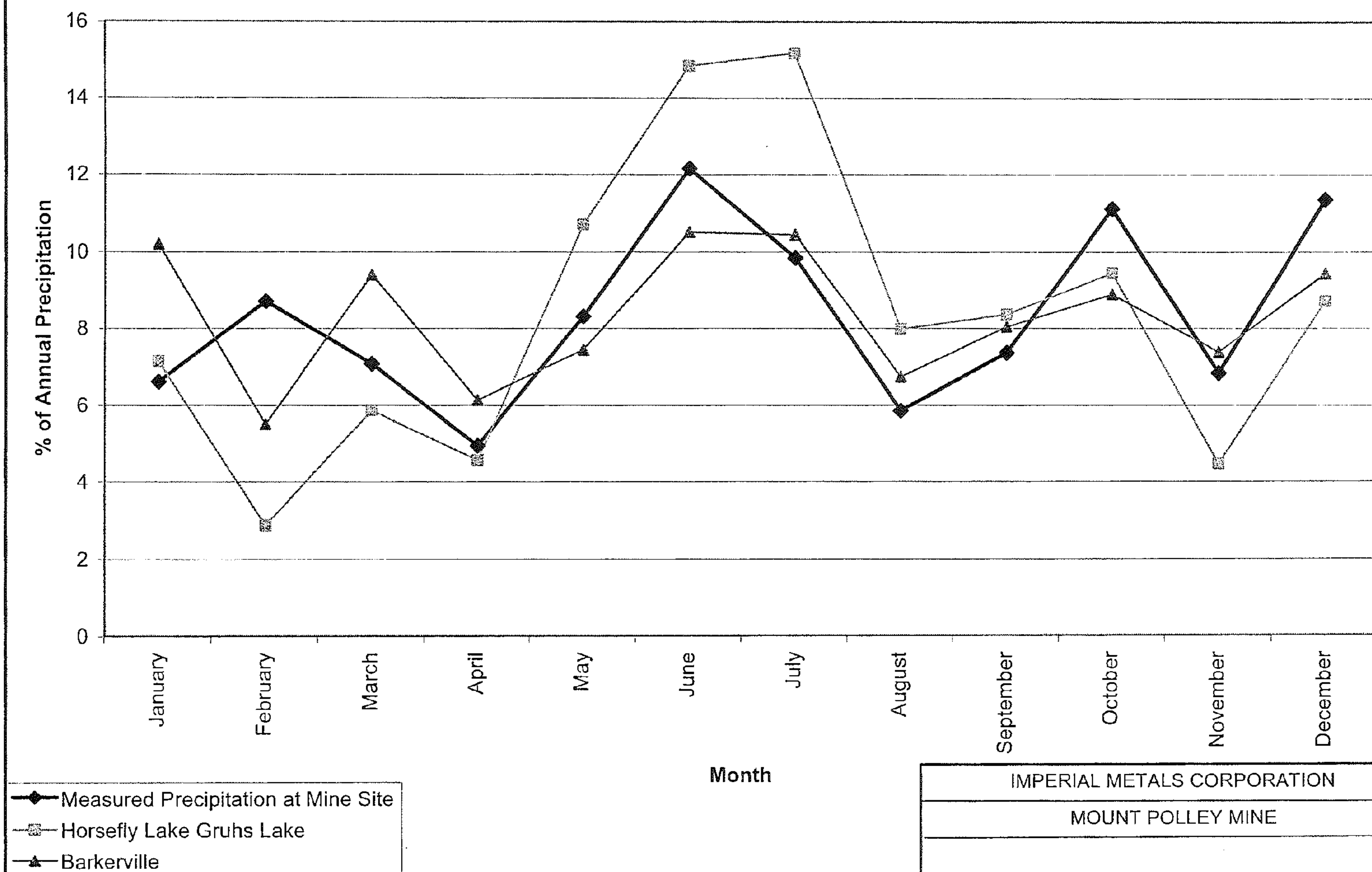
IMPERIAL METALS CORPORATION
MOUNT POLLEY MINE
AVERAGE MONTHLY PRECIPITATION FOR MAY 1997 TO DECEMBER 2002

Knight Piésold CONSULTING	PROJECT NO 101-1/6	REF. NO V4-0816	REV 0
	FIGURE 2		

M:\1\01\01\06\A\Data\Water Balance July 30\Tables and Figures_r0



Note: 1. Site data supplied by Mount Polley Mine.

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IMPERIAL METALS CORPORATION

MOUNT POLLEY MINE

MONTHLY % OF ANNUAL PRECIPITATION

Knight Piésold CONSULTING

PROJECT NO	REF. NO	REV
101-1/6	V4-0816	0

FIGURE 3

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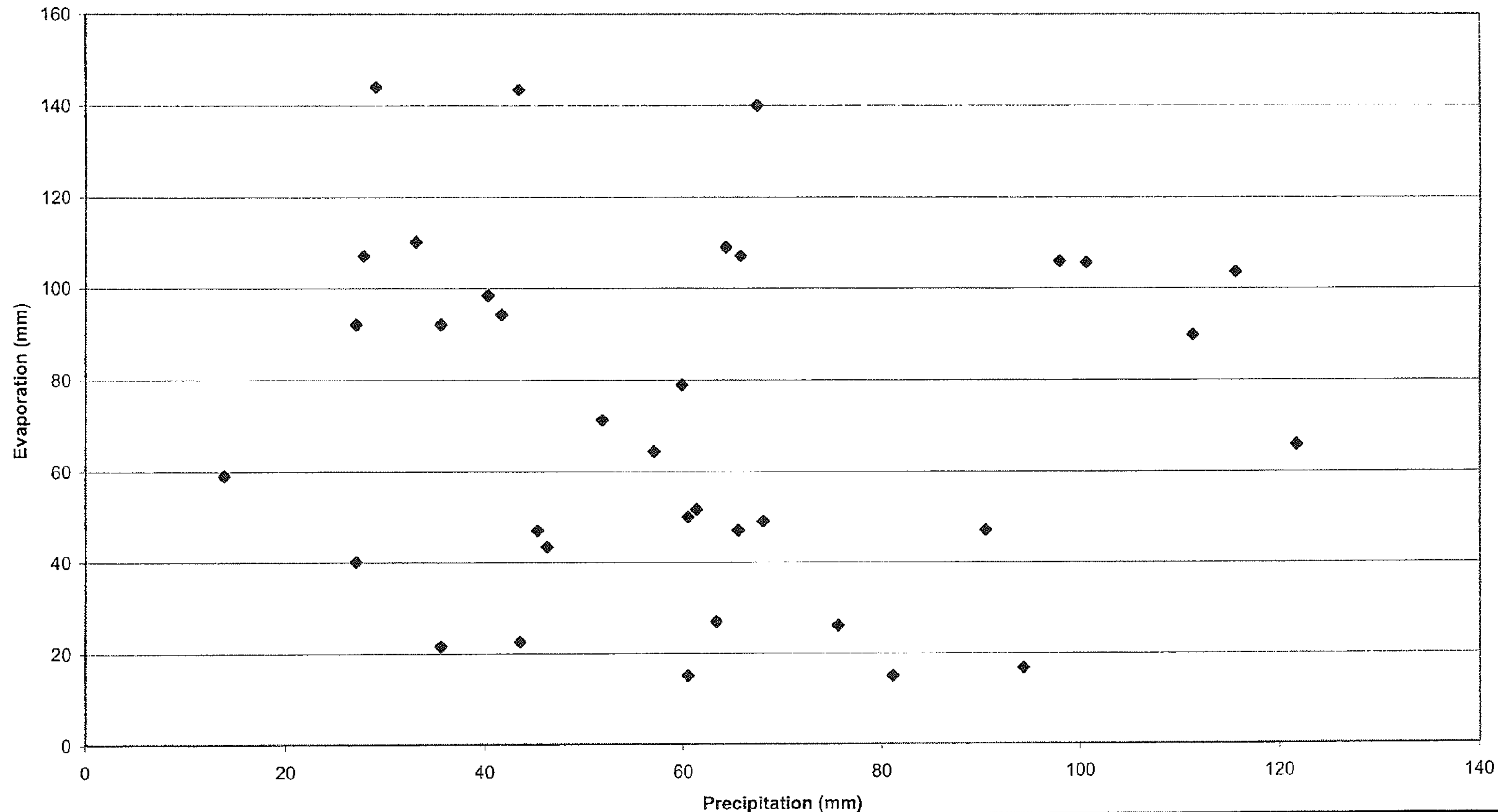

Note: 1. Data for November to April, when no evaporation is expected, is not included in this gragh.

IMPERIAL METALS CORPORATION			
MOUNT POLLEY MINE			
EVAPORATION VS PRECIPITATION FOR THE SITE (1997 - 2003)			
Knight Piésold CONSULTING	PROJECT NO 101-1/6	REF. NO V4-0816	REV 0
	FIGURE 4		

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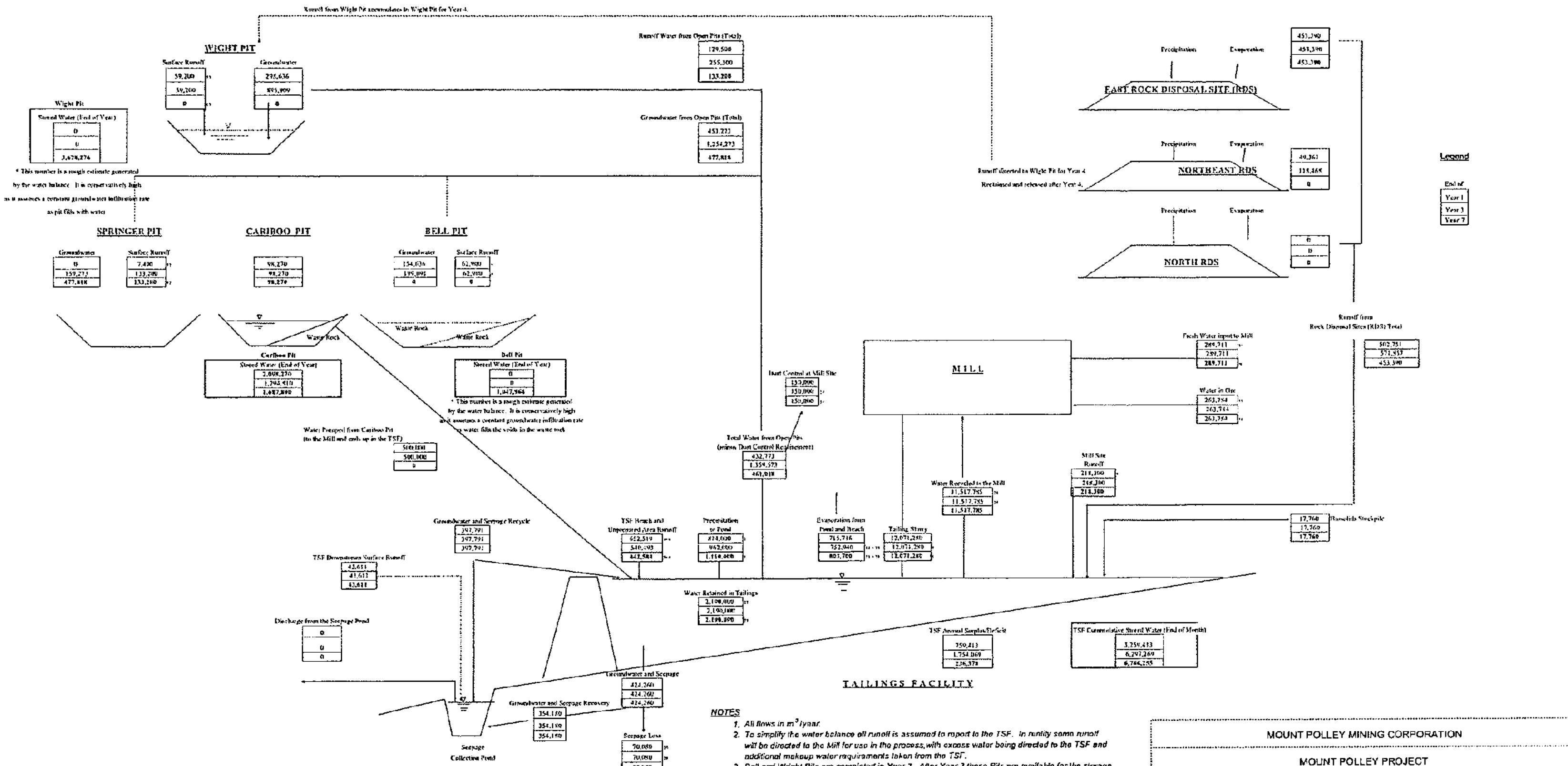
17-G

M:\1\01\00001\06\V\Data\water balance July 30\[Tables and Figures_rev 0.xls]Figure 5_r0

22-0



NOTES

1. *All flows in m^3/year.*
2. *To simplify the water balance all runoff is assumed to report to the TSF. In reality some runoff will be directed to the Mill for use in the process, with excess water being directed to the TSF and additional makeup water requirements taken from the TSF.*
3. *Bell and Wright Pits are completed in Year 3. After Year 3 these Pits are available for the storage of excess TSF water.*
4. *Year 3 is expected to have the maximum water surplus.*

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY PROJECT

TAILINGS STORAGE FACILITY
SCHEMATIC ILLUSTRATION OF WATER BALANCE
BASE CASE OPERATIONS OPTION - YEARS 1, 3, AND 7

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VA101-1/6 | V4-0015 | REV 0

FIGURE 5

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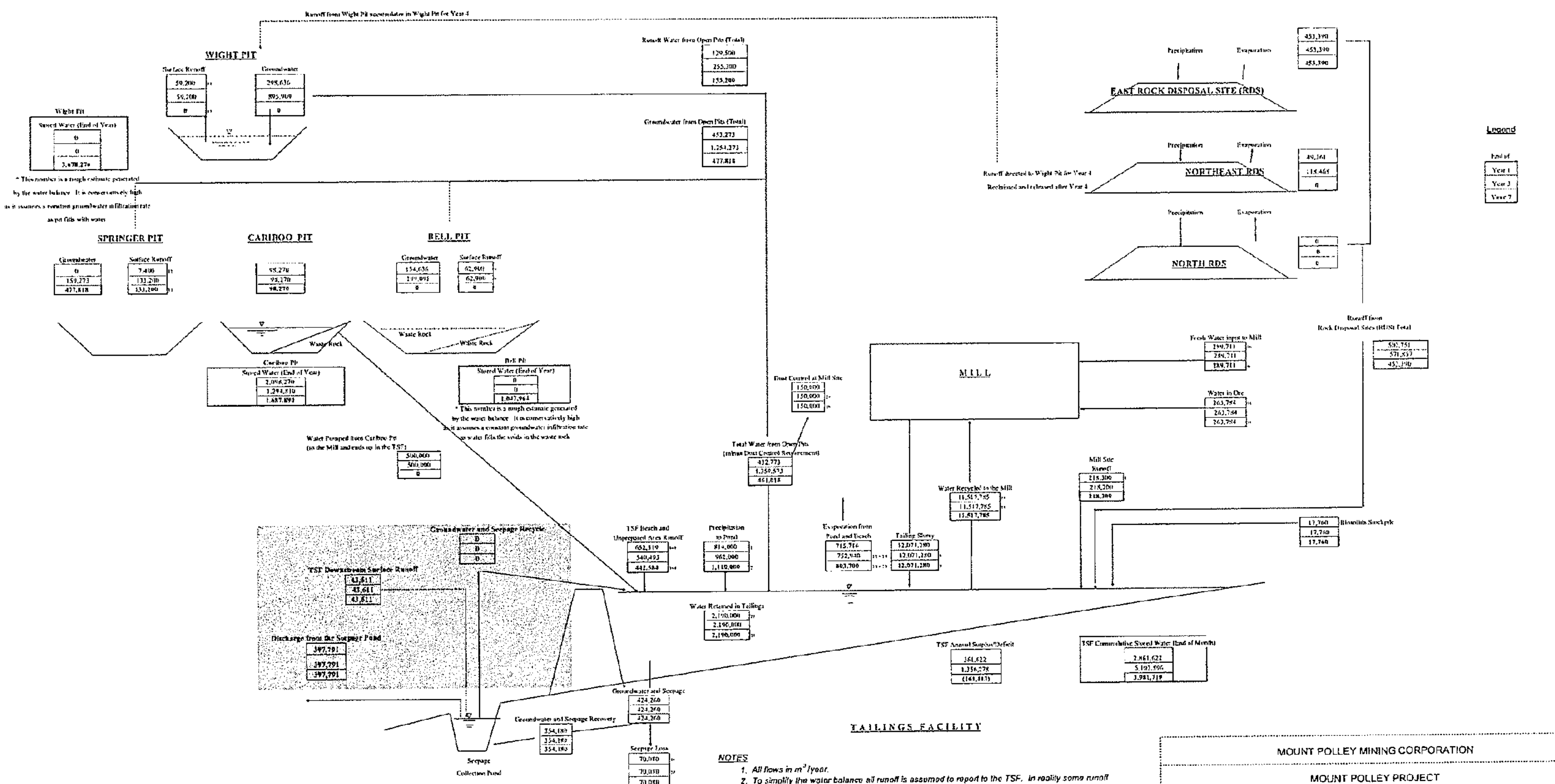
M:\1\01\00001\06\A\Data\water balance July 30\[Tables and Figures_rev 0.xls]Figure 6_r0



NOTES

1. All flows in m^3/year.
2. To simplify the water balance all runoff is assumed to report to the TSF. In reality some runoff will be directed to the Mill for use in the process, with excess water being directed to the TSF and additional makeup water requirements taken from the TSF.
3. Bell and Wright Pits are completed in Year 3. After Year 3 these Pits are available for the storage of excess TSF water.
4. Year 3 is expected to have the maximum water surplus.

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY PROJECT

TAILINGS STORAGE FACILITY
SCHEMATIC ILLUSTRATION OF WATER BALANCE
DISCHARGE OPTION - YEARS 1, 3, AND 7

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VA101-1/5 V4-0616 REV 0

FIGURE 6

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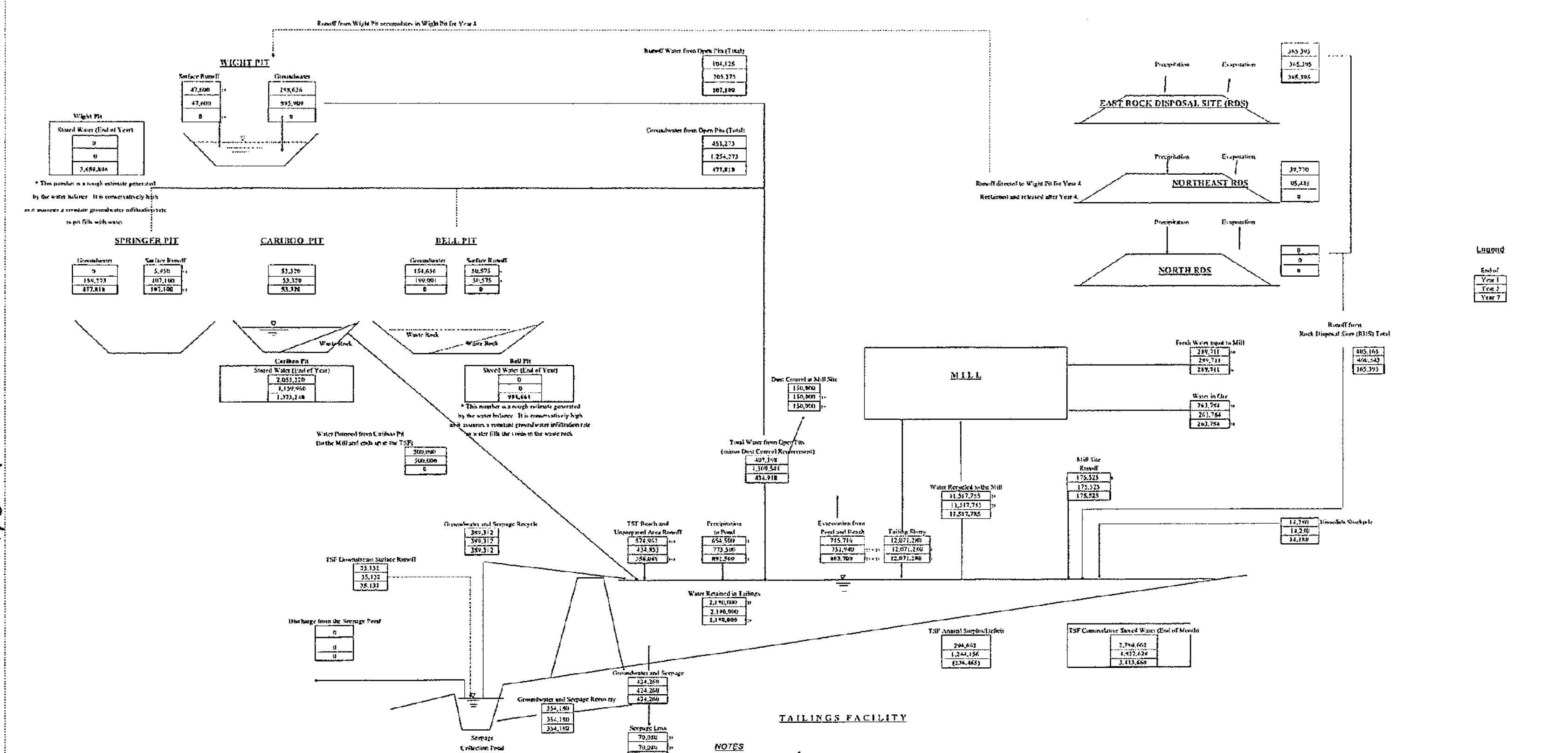
0-23

AMEC010450_0132

M:\1\01\00001\06\A\Data\water balance July 30\[Tables and Figures_rev 0.xls]Figure 7_r0



TAILINGS FACILITY

NOTES

1. *All flows in m^3/year.*
2. *To simplify the water balance all runoff is assumed to report to the TSF. In reality some runoff will be directed to the Mill for use in the process, with excess water being directed to the TSF and additional makeup water requirements taken from the TSF.*
3. *Bell and Wright Pits are completed in Year 3. After Year 3 these Pits are available for the storage of excess TSF water.*
4. *Year 3 is expected to have the maximum water surplus.*
5. *This option assumes 7 dry years (ie. based on actual 2002/3 site records) in succession.*

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY PROJECT

TAILINGS STORAGE FACILITY
SCHEMATIC ILLUSTRATION OF WATER BALANCE
DRY CONDITIONS WITH NO DISCHARGE OPTION
- YEARS 1, 3, AND 7

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VA101-1/6 | V4-0616 | 0

FIGURE 7

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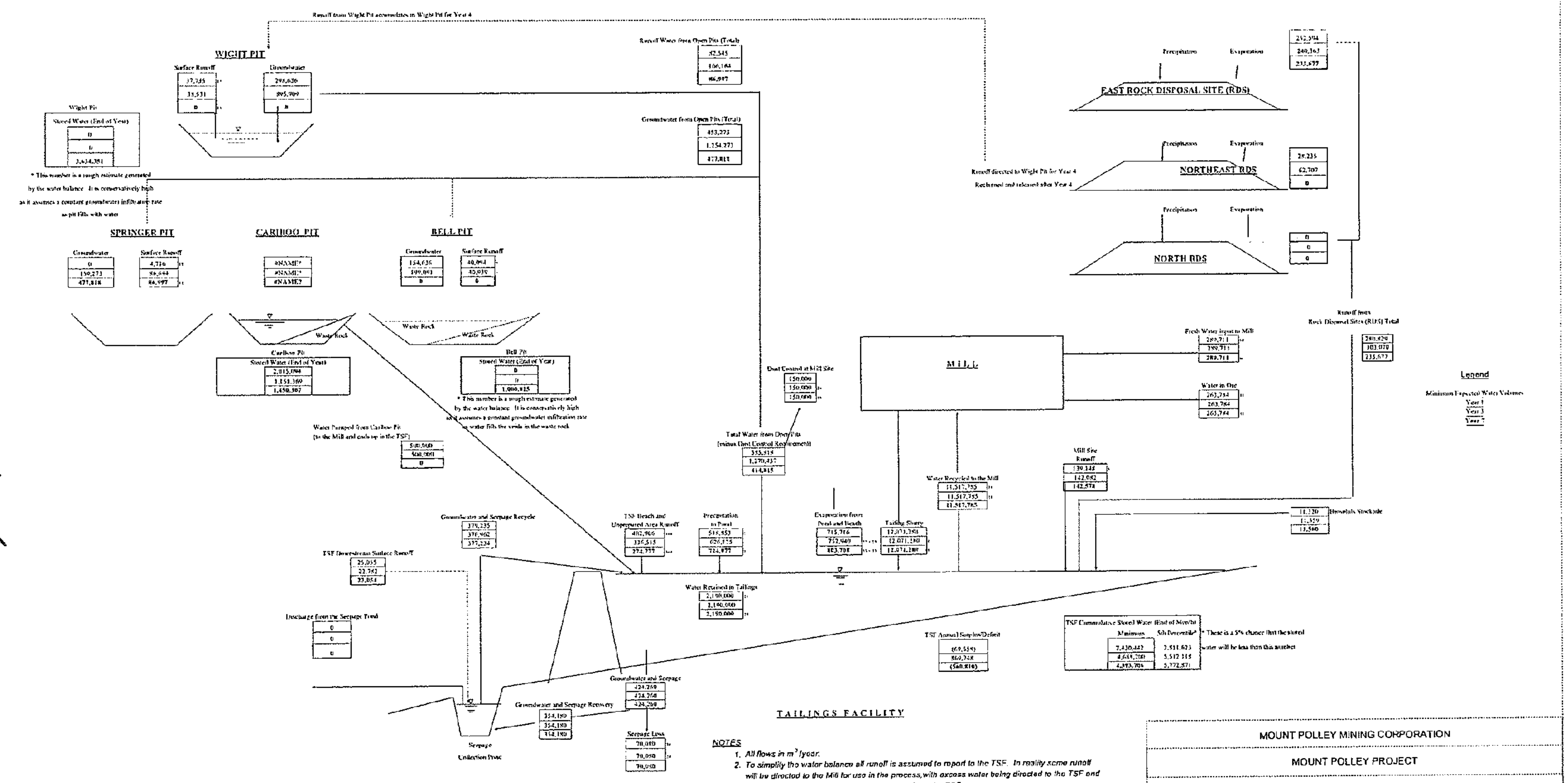
AMEC010450_0133

M:\1\01\00001\06\A\Data\water balance July 30\[Tables and Figures_rev 0.xls]Figure 8_r0

D-25



NOTES

1. All flows in m^3/year.
2. To simplify the water balance all runoff is assumed to report to the TSF. In reality some runoff will be directed to the Mill for use in the process, with excess water being directed to the TSF and additional makeup water requirements taken from the TSF.
3. Bell and Wright Pits are completed in Year 3. After Year 3 these Pits are available for the storage of excess TSF water.
4. Year 3 is expected to have the maximum water surplus.
5. The @RISK software was used with 1000 iterations to predict Minimum Water Volumes for the water balance (no discharge).

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY PROJECT

TAILINGS STORAGE FACILITY
SCHEMATIC ILLUSTRATION OF WATER BALANCE
@RISK ANALYSIS FOR DRY CONDITIONS - YEARS 1, 3, AND 7

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VA101-1/6 | V4-0816 | 0

FIGURE 8

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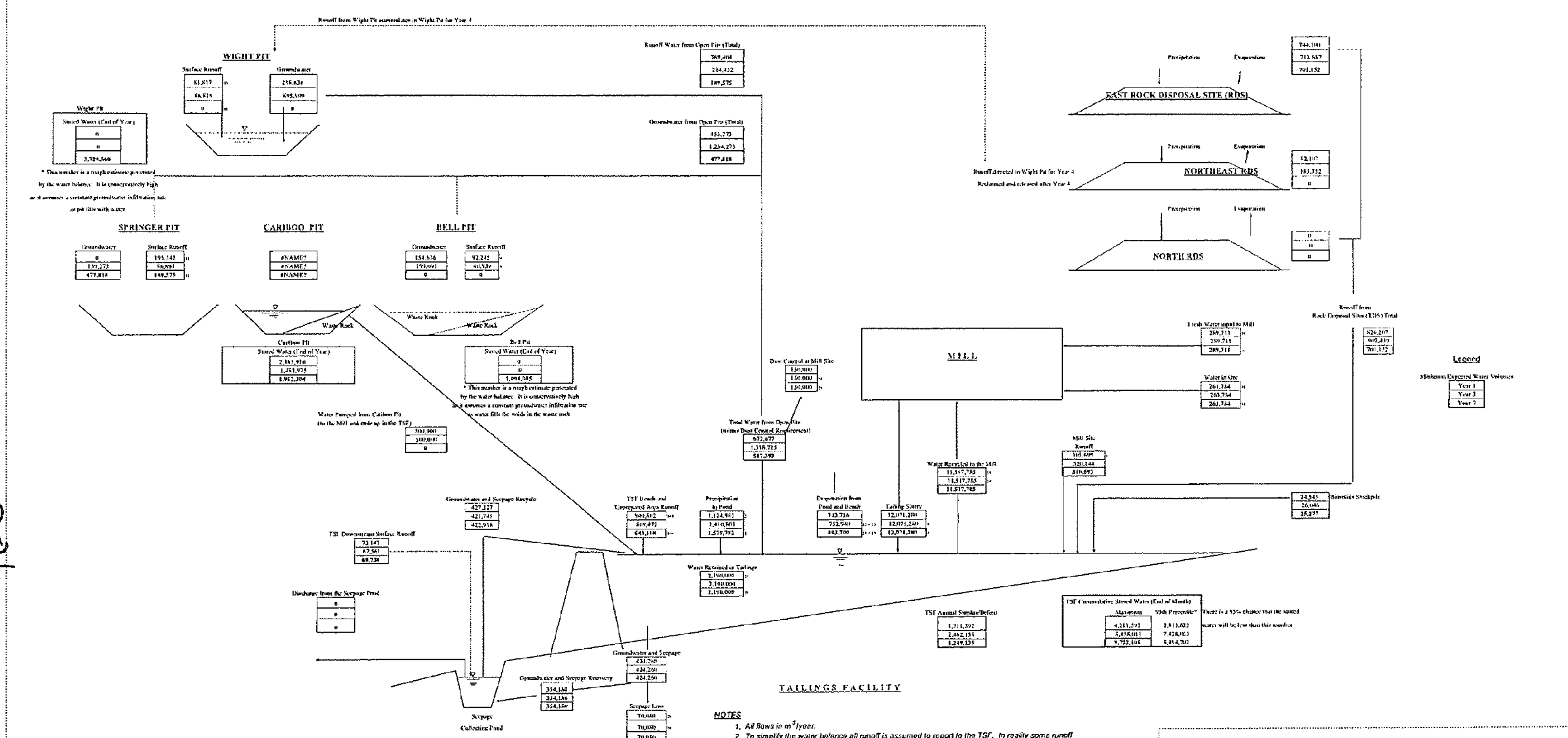
AMEC010450_0134

M:\1\01\00001\06\A\Data\water balance July 30\[Tables and Figures_rev 0.xls]Figure 9_r0



NOTES

1. All flows in m^3/year.
2. To simplify the water balance all runoff is assumed to report to the TSF. In reality some runoff will be directed to the Mill for use in the process, with excess water being directed to the TSF and additional makeup water requirements taken from the TSF.
3. Bell and Wright Pits are completed in Year 3. After Year 3 these Pits are available for the storage of excess TSF water.
4. Year 3 is expected to have the maximum water surplus.
5. The @RISK software was used with 1000 iterations to predict Maximum Water Volumes for the water balance (no discharge).

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY PROJECT

TAILINGS STORAGE FACILITY
SCHEMATIC ILLUSTRATION OF WATER BALANCE
@RISK ANALYSIS FOR WET CONDITIONS - YEARS 1, 3, AND 7

Knight Piésold CONSULTING

VA101-1/6 | V4-0816 | REV 0

FIGURE 9

D-22

TABLE D-1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

SITE WATER BALANCE - NO DISCHARGE
YEAR 1

ASSUMPTIONS:

Solids Content 35%
Tailings S.G. = 2.65
Water Content of Ore = 4%
Dry Density (t/m^3) = 1.4
Initial Volume TSF (m^3) = 2,500,000
Minimum Desired Volume = 1,000,000
Minimum Fresh Water Makeup = 2.4%
Underdrainage Recovery - Back to TSF (m^3)= 0
Initial Volume Cariboo Pit (m^3)= 2,500,000
Initial Volume Wight Pit = 0
Initial Volume Bell Pit (m^3)= 75,000 Assume pumped to TSF
Groundwater Seepage Loss (m^3/month) = 5,840

Discharge from Seepage Pond (Yes/no) no

Runoff Coefficients:

	General	Freshet	Low Flow Period
Unprepared Basin=	0.35	1	0
Tailings Beach =	0.9	0.9	
Open Pit Area=	0.5	0.5	
Undisturbed RDS Areas =	0.24	1	0
Millsite Area =	0.50	0.5	
East RDS -Disturbed =	0.60	1	0
Downstream Tailings Areas =	0.7	1	0
North RDS - Disturbed =	0.6	1	
Northeast RDS - Disturbed =	0.6	1	0

Areas:

Open Pits
Bell Pit (Area A) = 17
Diversion Efficiency = 0%
Springer Pit (Area B) = 2
Diversion Efficiency = 0%
Wight Pit (Area C) = 17
Diversion Efficiency = 0%
Cariboo Pit Area (Area D1) = 31
Cariboo Pit acts as a water storage pond

Rock Disposal Sites (RDS)
East Rock Disposal Site (RDS) - Disturbed (Area E1) = 55
Diversion Efficiency = 0%
East RDS - Undisturbed (Area E2) = 89
Diversion Efficiency = 0%
North RDS - Disturbed (Area F1) = 7
Diversion Efficiency = 100%
North RDS - Undisturbed (Area F2) = 9
Diversion Efficiency = 100%
Northeast RDS -Disturbed Area (Area G1) = 15
Diversion Efficiency = 0%
Northeast RDS - Un-Disturbed Area (Area G2) = 21
Diversion Efficiency = 100%

Mill Site
Millsite Area (Area H) = 59
Diversion Efficiency = 0%

Tailing Storage Facility (TSF)
Total Tailings Facility Area = 235.0
Pond Area (Area I) = 110.0
Beach Area (Area J) = 74.0

Unprepared Area (Area K) = 51.0
Biosolids Stockpile (Area L) = 4
Diversion Efficiency = 0%
Downstream Seepage Pond and Area (Area M) = 13
Diversion Efficiency = 0%

Groundwater Infiltration:		% to TSF
Cariboo Pit Groundwater Infiltration (m^3/mo) =	0	0
(gpm) =	0	
Wight Pit Groundwater Infiltration (m3/mo) =	25,364	100%
(gpm) =	150	
Bell Pit Groundwater Infiltration (m3/mo) =	6,764	100%
(gpm) =	40	
Springer Pit Groundwater Infiltration (m3/mo) =	0	100%
(gpm) =	0	

Note:
Water that reports to Cariboo Pit is stored in place and does not enter the TSF.

Water Pumped to Other Pits from the TSF

To Wight Pit (m3/year) = 0
To Cariboo Pit (m3/year) = 0
To Bell Pit (m3/year) = 0

Water Pumped to the TSF from Cariboo Pit
To TSF (m3/year) = 500,000

Printed 3/14/2005
Rev'd 3/11/2005

M:\1\01\00001\08\A\Report\Report 1\Appendix D\[Figure D1.XLS]yr.1

	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	
Daily Ore Throughput (tpd) =	0	0	0	0	18900	19300	19300	19300	19011	19011	19011	19011	
					2005								
DESCRIPTION	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	ANNUAL
Precipitation (mm/month)	63.9	64.0	63.7	37.7	30.0	40.1	55.1	111.2	80.1	90.6	46.6	56.9	740
% of Annual Precipitation	8.6%	8.7%	8.7%	5.1%	4.1%	5.4%	7.4%	15.0%	10.8%	12.2%	6.3%	7.7%	100%
Evaporation (mm/month)	0.0	0.0	0.0	0.0	0.0	0.0	47.0	112.0	107.0	92.0	50.0	15.0	423
Days per Month	30.0	31.0	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	365
<WATER INTO TAILINGS IMPOUNDMENT> (m^3)													
Open Pits													
Bell Pit (Area 7a)	5,433	0	0	0	3,961	10,440	10,311	9,452	6,806	7,701	3,962	4,833	62,900
Bell Pit Groundwater 2006	0	0	0	0	0	0	0	0	0	0	0	0	0
Springer Pit (Area 11)	639	0	0	0	466	1,228	1,213	1,112	801	906	466	569	7,400
Springer Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Wight Pit (Area 12)	0	0	0	0	0	10,440	10,311	9,452	6,806	7,701	3,962	4,833	53,506
Wight Pit Groundwater	0	0	0	0	0	0	0	24,545	25,364	25,364	24,545	25,364	125,182
Rock Disposal Sites (RDS)													
East RDS - Disturbed (Area 5a)	21,094	0	0	0	25,628	67,554	66,716	0	0	0	0	0	180,992
East RDS - Undisturbed (Area 5b)	13,654	0	0	0	41,471	109,314	107,959	0	0	0	0	0	272,398
North RDS - Disturbed (Area 7b)	0	0	0	0	0	0	0	0	0	0	0	0	0
North RDS Undisturbed (Area 7b)	0	0	0	0	0	0	0	0	0	0	0	0	0
Northeast RDS - Disturbed (Area 13a)	5,753	0	0	0	6,990	18,424	18,195	0	0	0	0	0	49,361
Northeast RDS - Undisturbed (Area 13b)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mill Site													
With Slurry	0	0	0	0	1,067,625	1,090,220	1,090,220	1,090,220	1,073,895	1,073,895	1,073,895	1,073,895	8,633,866
Mill Site (Area 6)	18,857	0	0	0	13,746	36,233	35,784	32,805	23,621	26,727	13,752	16,775	218,300
Tailings Storage Facility (TSF)													
Tailings Pond Precipitation (Area 1)	70,314	0	0	0	51,256	135,107	133,432	122,325	88,078	99,659	51,278	62,550	814,000
Tailings Beach Runoff (Area 2)	42,572	0	0	0	31,033	81,801	80,787	74,062	53,327	60,339	31,047	37,871	492,840
Unprepared Area Tailings Facility (Area 3)	11,410	0	0	0	23,764	62,641	61,864	0	0	0	0	0	159,679
Topsoil Stockpile (Area 4)	1,534	0	0	0	1,118	2,948	2,911	2,669	1,922	2,174	1,119	1,365	17,760
TSF Downstream Surface Runoff (Area 9)	5,817	0	0	0	6,058	15,967	15,769	0	0	0	0	0	43,611
>>> Total in	197,078	0	0	0	1,273,117	1,642,317	1,635,472	1,366,645	1,280,619	1,304,466	1,204,027	1,228,055	11,131,795
<WATER OUT OF TAILINGS IMPOUNDMENT> (m^3)													
Unrecoverable Water and Water Discharged from the Seepage Pond													
(-) Seepage Loss	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	70,080
(-) Water Retained in Tailings	0	0	0	0	197,406	195,081	201,584	195,081	198,565	198,565	192,160	198,565	1,577,006
(-) Evaporation from Supernatant Pond	0	0	0	0	0	0	51,700	123,200	117,700	101,200	55,000	16,500	465,300
(-) Groundwater and Seepage Discharge	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) TSF Surface Runoff discharged from the Seepage Pond	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total	5,840	5,840	5,840	5,840	203,246	200,921	259,124	324,121	322,105	305,605	253,000	220,905	2,112,386
Recoverable Water													
(-) Water Recycled to Mill	0	0	0	0	1,018,992	1,040,558	1,064,774	1,065,558	1,049,205	1,049,205	1,049,205	1,049,976	8,387,471
(+/-) Pond Water Accumulating or Lost	191,238	-5,840	-5,840	-5,840	50,880	400,839	311,575	-23,034	-90,691	-50,344	-98,178	-42,826	631,938
(-) Discharge to Caribou Pit	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Water Pumped to Wight Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Water Pumped to Bell Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Discharge from Seepage Recycle Ponds	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total	191,238	-5,840	-5,840	-5,840	1,069,871	1,441,396	1,376,349	1,042,524	958,514	998,861	951,027	1,007,150	9,019,409
>>> Total out	197,078	0	0	0	1,273,117	1,642,317	1,635,472	1,366,645	1,280,619	1,304,466	1,204,027	1,228,055	11,131,795
Monthly Water Available (excluding stored water in the TSF)	191,238	-5,840	-5,840	-5,840	1,069,871	1,441,396	1,376,349	1,042,524	958,514	998,861	951,027	1,007,150	9,019,409
Available Stored Water in TSF at Beginning of Month	2,500,000	2,400,000	2,394,160	2,388,320	2,424,147	2,516,693	2,959,198	3,312,440	3,331,073	3,282,048	3,273,371	3,216,860	
Total Monthly Water Available	2,691,238	2,394,160	2,388,320	2,382,480	3,494,018	3,958,089	4,335,547	4,354,963	4,289,586	4,280,909	4,224,398	4,224,010	43,017,719
Water Required at Millsite													
Water for slurry	0	0	0	0	1,067,625	1,090,220	1,090,220	1,090,220	1,073,895	1,073,895	1,073,895	1,073,895	8,633,866
(-) Minimum Fresh Water Input to Mill (from groundwater wells)	0	0	0	0	25,623	26,165	28,165	26,165	25,773	25,773	25,773	25,773	207,213
(-) Water in Ore	0	0	0	0	23,010	23,497	24,281	23,497	23,917	23,917	23,917	23,146	189,183
Total Water Recycled to Mill	0	0	0	0	1,018,992	1,040,558	1,039,774	1,040,558	1,024,205	1,024,205	1,024,205	1,024,976	8,237,471
Water for Dust Control on Roads (from Open Pit water)	0	0	0	0	0	0	25,000	25,000	25,000	25,000	25,000	25,000	150,000
Total Water Required	0	0	0	0	1,018,992	1,040,558	1,064,774	1,065,558	1,049,205	1,049,205	1,049,205	1,049,976	8,387,471
Water Surplus (Deficit) After Recycle to Process	191,238	(5,840)	(5,840)	(5,840)	50,880	400,839	311,575	(23,034)	(90,691)	(50,344)	(98,178)	(42,826)	631,938
Annual Cumulative Surplus (Deficit)	191,238	185,398	179,558	173,718	224,597	625,436	937,010	913,977	823,286	772,942	674,764	631,938	
<CARIBOO PIT> (m^3)													
Water Stored in Cariboo Pit at the Beginning of the Month	2,500,000	2,519,816	2,519,816	2,519,816	2,478,149	2,450,927	2,447,336	2,428,703	2,386,790	2,336,775	2,294,674	2,251,959	
Cariboo Pit Precipitation (Area 8)	19,816	0	0	0	14,445	38,076	37,604	34,474	24,822	28,086	14,451	17,628	229,400
Cariboo Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Cariboo Pit Evaporation	0	0	0	0	0	0	14,570	34,720	33,170	28,520	15,500	4,850	131,130
Water Pumped to the TSF from Cariboo Pit	0	0	0	41,667	41,667	41,667	41,667	41,667	41,667	41,667	41,667	41,667	375,000
Water Pumped to Cariboo Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Stored in Cariboo Pit at the End of the Month	2,519,816	2,519,816	2,519,816	2,478,149	2,450,927	2,447,336	2,428,703	2,386,790	2,336,775	2,294,674	2,251,959	2,223,270	2,223,270
<WIGHT PIT> (m^4)													
Water Stored in Wight Pit at the Beginning of the Month	0	0	0	0	0	0	0	0	0	0	0	0	
Wight Pit Precipitation	0	0	0	0	0	0	0	0	0	0	0	0	0
Wight Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Wight Pit Evaporation	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Pumped to Wight Pit from the Northeast RDS	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Pumped to Wight Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Stored in Wight Pit at the End of the Month	0	0	0	0	0	0	0	0	0	0	0	0	0
<BELL PIT> (m^3)													
Water Stored in Bell Pit at the Beginning of the Month (pumped to TSF) 75000m3	0	0	0	0	0	0	0	0	0	0	0	0	
Bell Pit Precipitation	0	0	0	0	0	0	0	0	0	0	0	0	0
Bell Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Bell Pit Evaporation	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Pumped to Bell Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Stored in Bell Pit at the End of the Month	0	0	0	0	0	0	0	0	0	0	0	0	0
Water in TSF at End of Month	2,691,238	2,394,160	2,388,320	2,424,147	2,516,693	2,959,198	3,312,440	3,331,073	3,282,048	3,273,371	3,216,860	3,215,701	3,215,701

Notes:
* The Bell Pit is already largely developed and will be developed to its ultimate surface area in Year 1. The pit is assumed to already be producing groundwater at its ultimate rate.
* The Wight Pit will be developed in Year 1. It's ultimate surface area will be disturbed Year 1 and it's ultimate depth will be reached in Year 3.
* The Springer Pit is developed in Year 2. It's ultimate surface Area is disturbed in Year 2 and its ultimate depth is reached in Year 7.
* The Northeast Rock Disposal Site (RDS) is developed in Year 1 to its ultimate surface area.
* Groundwater inflow to the pit is assumed to relate to pit depth, and therefore development time, so yearly inflow rates are estimated using a linear relationship between time and inflow rate.
* Groundwater infiltration is assumed to be 0 until pit devlopment commences and then estimated at 240 gpm for Bell and Springer Pits and 450 gpm for Wight Pit once they are fully developed.
* All waste rock will be placed in the Northeast RDS and the North and East RDS's will not be expanded past the current disturbed area.
* Water from all disturbed areas is captured and directed to the TSF (or Mill). The collection ditches closely surround the disturbed areas.
* Water from undisturbed areas is diverted away from mine features.
* Assumes no groundwater input or seepage to or from Cariboo Pit.

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TABLE D-1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

SITE WATER BALANCE - NO DISCHARGE
YEAR 2

ASSUMPTIONS:

Solids Content 35%
Tailings S.G. = 2.65
Water Content of Ore = 4%
Dry Density (t/m^3) = 1.4
Initial Volume (m^3) = 3,215,701
Minimum Desired Volume = 1,000,000
Minimum Fresh Water Makeup = 2.4%
Underdrainage Recovery - Back to TSF (m^3)= 0
Initial Volume Cariboo Pit (m^3)= 2,223,270
Initial Volume Wight Pit = 0
Initial Volume Bell Pit (m^3)= 0
Groundwater Seepage Loss (m^3/month) = 5,840

Discharge from Seepage Pond (Yes/no) no

Runoff Coefficients:

	General	Freshet	Low Flow Period
Unprepared Basin=	0.35	1	
Tailings Beach =	0.9	0.9	
Open Pit Area=	0.5	0.5	
Undisturbed RDS Areas =	0.24	1	0
Millsite Area =	0.50	0.5	
East RDS -Disturbed =	0.60	1	0
Downstream Tailings Areas =	0.7	1	
North RDS - Disturbed =	0.6	1	
Northeast RDS - Disturbed =	0.6	1	0

Areas:

Open Pits
Bell Pit (Area A) = 17
Diversion Efficiency = 0%
Springer Pit (Area B) = 36
Diversion Efficiency = 0%
Wight Pit (Area C) = 17
Diversion Efficiency = 0%
Cariboo Pit Area (Area D1) = 31
Cariboo Pit acts as a water storage pond

Rock Disposal Sites (RDS)
East Rock Disposal Site (RDS) - Disturbed (Area E1) = 55
Diversion Efficiency = 0%
East RDS - Undisturbed (Area E2) = 89
Diversion Efficiency = 0%
North RDS - Disturbed (Area F1) = 9
Diversion Efficiency = 100%
North RDS - Undisturbed (Area F2) = 7
Diversion Efficiency = 100%
Northeast RDS -Disturbed Area (Area G1) = 26
Diversion Efficiency = 0%
Northeast RDS - Un-Disturbed Area (Area G2) = 10
Diversion Efficiency = 100%

Mill Site
Millsite Area (Area H) = 59
Diversion Efficiency = 0%

Tailing Storage Facility (TSF)
Total Tailings Facility Area = 235.0
Pond Area (Area I) = 120.0
Beach Area (Area J) = 67.0

Unprepared Area (Area K) = 48.0
Biosolids Stockpile (Area L) = 4
Diversion Efficiency = 0%
Downstream Seepage Pond and Area (Area M) = 13
Diversion Efficiency = 0%

Groundwater Infiltration:		% to TSF
Cariboo Pit Groundwater Infiltration (m^3/mo) =	0	0
(gpm) =	0	
Wight Pit Groundwater Infiltration (m3/mo) =	50,727	100%
(gpm) =	300	
Bell Pit Groundwater Infiltration (m3/mo) =	11,836	100%
(gpm) =	70	
Springer Pit Groundwater Infiltration (m3/mo) =	6,764	100%
(gpm) =	40	

Note:
Water that reports to Cariboo Pit is stored in place and does not enter the TSF.

Water Pumped to Other Pits from the TSF

To Wight Pit (m3/year) = 0
To Cariboo Pit (m3/year) = 0
To Bell Pit (m3/year) = 0

Water Pumped to the TSF from Cariboo Pit
To TSF (m3/year) = 500,000

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DESCRIPTION	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	ANNUAL
Daily Ore Throughput (tpd) =	18888	18888	18888	18888	18888	18888	18888	18888	18888	18888	18888	18888	
	2006												
Precipitation (mm/month)	64	64	64	38	30	40	55	111	80	91	47	57	740
% of Annual Precipitation	8.6%	8.7%	8.7%	5.1%	4.1%	5.4%	7.4%	15.0%	10.8%	12.2%	6.3%	7.7%	100%
Evaporation (mm/month)	0.0	0.0	0.0	0.0	0.0	0.0	47.0	112.0	107.0	92.0	50.0	15.0	423
Days per Month	30.0	31.0	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	365
<WATER INTO TAILINGS IMPOUNDMENT> (m^3)													
Open Pits													
Bell Pit (Area 7a)	5,433	0	0	0	3,961	10,440	10,311	9,452	6,806	7,701	3,962	4,833	62,900
Bell Pit Groundwater	11,455	11,836	11,836	10,691	11,836	11,455	11,836	11,455	11,836	11,836	11,455	11,836	139,364
Springer Pit (Area 11)	11,506	0	0	0	8,387	22,108	21,834	20,017	14,413	16,308	8,391	10,235	133,200
Springer Pit Groundwater	6,545	6,764	6,764	6,109	6,764	6,545	6,764	6,545	6,764	6,764	6,545	6,764	79,636
Wight Pit (Area 12)	5,433	0	0	0	3,961	10,440	10,311	9,452	6,806	7,701	3,962	4,833	62,900
Wight Pit Groundwater	49,091	50,727	50,727	45,818	50,727	49,091	50,727	49,091	50,727	50,727	49,091	50,727	597,273
Rock Disposal Sites (RDS)													
East RDS - Disturbed (Area 5a)	21,094	0	0	0	25,628	67,554	66,716	0	0	0	0	0	180,992
East RDS - Undisturbed (Area 5b)	13,654	0	0	0	41,471	109,314	107,959	0	0	0	0	0	272,398
North RDS - Disturbed (Area 7b)	0	0	0	0	0	0	0	0	0	0	0	0	0
North RDS Undisturbed (Area 7b)	0	0	0	0	0	0	0	0	0	0	0	0	0
Northeast RDS - Disturbed (Area 13a)	9,972	0	0	0	12,115	31,934	31,539	0	0	0	0	0	85,560
Northeast RDS - Undisturbed (Area 13b)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mill Site													
With Slurry	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	12,803,366
Mill Site (Area 6)	18,857	0	0	0	13,746	36,233	35,784	32,805	23,621	26,727	13,752	16,775	218,300
Tailings Storage Facility (TSF)													
Tailings Pond Precipitation (Area 1)	76,706	76,655	76,416	45,298	36,059	48,105	66,135	133,446	96,085	108,719	55,940	68,237	886,000
Tailings Beach Runoff (Area 2)	38,545	0	0	0	28,098	74,063	73,145	67,057	48,283	54,631	28,110	34,289	446,220
Unprepared Area Tailings Facility (Area 3)	10,739	0	0	0	22,366	58,956	58,225	0	0	0	0	0	150,286
Biosolids Stockpile (Area 4)	1,534	0	0	0	1,118	2,948	2,911	2,669	1,922	2,174	1,119	1,365	17,760
Downstream Seepage Pond and Area (Area 9)	5,817	0	0	0	6,058	15,967	15,769	0	0	0	0	0	43,611
>>> Total	1,353,329	1,213,130	1,212,691	1,174,863	1,339,243	1,622,101	1,636,913	1,408,937	1,334,209	1,360,235	1,249,274	1,276,842	16,181,765
<WATER OUT OF TAILINGS IMPOUNDMENT> (m^3)													
Unrecoverable Water													
(-) Seepage Loss	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	70,080
(-) Water Retained in Tailings	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	2,322,817
(-) Evaporation from Supernatant Pond	0	0	0	0	0	0	56,400	134,400	128,400	110,400	60,000	18,000	507,600
(-) Groundwater and Seepage dicharge	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) TSF Surface Runoff discharged from the Seepage Pond	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total	199,408	199,408	199,408	199,408	199,408	199,408	255,808	333,808	327,808	309,808	259,408	217,408	2,900,497
Recoverable Water													
(-) Water Recycled to Mill + Dust Control Requirement (taken from Pit Water)	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	12,366,303
(+/-) Pond Water Accumulating or Lost	135,895	-4,304	-4,743	-42,570	121,810	404,668	338,079	32,103	-36,624	7,402	-53,160	16,408	914,966
(-) Discharge to Caribou Pit	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Water Pumped to Wight Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Water Pumped to Bell Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Discharge from Seepage Recycle Ponds	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total	1,153,920	1,013,722	1,013,282	975,455	1,139,835	1,422,693	1,381,105	1,075,128	1,006,401	1,050,427	989,866	1,059,434	13,281,268
>>> Total	1,353,329	1,213,130	1,212,691	1,174,863	1,339,243	1,622,101	1,636,913	1,408,937	1,334,209	1,360,235	1,249,274	1,276,842	16,181,765
Monthly Water Available (excluding stored water in the TSF)	1,153,920	1,013,722	1,013,282	975,455	1,139,835	1,422,693	1,381,105	1,075,128	1,006,401	1,050,427	989,866	1,059,434	13,281,268
Available Stored Water in TSF at Beginning of Month	3,215,701	3,393,263	3,430,626	3,467,550	3,466,646	3,630,123	4,076,457	4,456,203	4,529,973	4,535,016	4,584,084	4,572,591	
Total Monthly Water Available	4,369,621	4,406,984	4,443,908	4,443,004	4,606,481	5,052,816	5,457,562	5,531,332	5,536,374	5,585,443	5,573,950	5,632,025	60,639,500
Water Required at Millsite													
Water for slurry	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	12,803,366
(-) Minimum Fresh Water Input to Mill (from groundwater wells)	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	307,281
(-) Water in Ore	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	279,782
Total Water Recycled to Mill	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	12,216,303
Water for Dust Control on Roads	0	0	0	0	0	0	25,000	25,000	25,000	25,000	25,000	25,000	150,000
Total Water Required	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	12,366,303
Water Surplus (Deficit) After Recycle to Process	135,895	(4,304)	(4,743)	(42,570)	121,810	404,668	338,079	32,103	(36,624)	7,402	(53,160)	16,408	914,966
Annual Cumulative Surplus (Deficit)	135,895	131,592	126,849	84,278	206,088	610,756	948,836	980,939	944,315	951,717	898,557	914,966	
<CARIBOO PIT> (m^3)													
Water Stored in Cariboo Pit at the Beginning of the Month	2,223,270	2,201,419	2,159,752	2,118,086	2,076,419	2,049,197	2,045,606	2,026,973	1,985,060	1,935,045	1,892,944	1,850,229	
Cariboo Pit Precipitation (Area 8)	19,816	0	0	0	14,445	38,076	37,604	34,474	24,822	28,086	14,451	17,628	229,400
Cariboo Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Cariboo Pit Evaporation	0	0	0	0	0	0	14,570	34,720	33,170	28,520	15,500	4,650	131,130
Water Pumped to the TSF from Cariboo Pit	41,667	41,667	41,667	41,667	41,667	41,667	41,667	41,667	41,667	41,667	41,667	41,667	333,333
Water Pumped to Cariboo Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Stored in Cariboo Pit at the End of the Month	2,201,419	2,159,752	2,118,086	2,076,419	2,049,197	2,045,606	2,026,973	1,985,060	1,935,045	1,892,944	1,850,229	1,821,540	1,821,540
<WIGHT PIT> (m^3)													
Water Stored in Wight Pit at the Beginning of the Month	0	0	0	0	0	0	0	0	0	0	0	0	
Wight Pit Precipitation	0	0	0	0	0	0	0	0	0	0	0	0	0
Wight Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Wight Pit Evaporation	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Pumped to Wight Pit from the Northeast RDS	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Pumped to Wight Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Stored in Wight Pit at the End of the Month	0	0	0	0	0	0	0	0	0	0	0	0	0
<BELL PIT> (m^3)													
Water Stored in Bell Pit at the Beginning of the Month (pumped to TSF)	0	0	0	0	0	0	0	0	0	0	0	0	
Bell Pit Precipitation	0	0	0	0	0	0	0	0	0	0	0	0	0
Bell Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Bell Pit Evaporation	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Pumped to Bell Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Stored in Bell Pit at the End of the Month	0	0	0	0	0	0	0	0	0	0	0	0	0
Water in TSF at End of Month	3,393,263	3,430,626	3,467,550	3,466,646	3,630,123	4,076,457	4,456,203	4,529,973	4,535,016	4,584,084	4,572,591	4,630,666	4,630,666

Notes:
* The Bell Pit is already largely developed and will be developed to its ultimate surface area in Year 1. The pit is assumed to already be producing groundwater at its ultimate rate.
* The Wight Pit will be developed in Year 1. It's ultimate surface area will be disturbed Year 1 and it's ultimate depth will be reached in Year 3.
* The Springer Pit is developed in Year 2. It's ultimate surface Area is disturbed in Year 2 and its ultimate depth is reached in Year 7.
* The Northeast Rock Disposal Site (RDS) is developed in Year 1 to its ultimate surface area.
* Groundwater inflow to the pit is assumed to relate to pit depth, and therefore development time, so yearly inflow rates are estimated using a linear relationship between time and inflow rate.
* Groundwater infiltration is assumed to be 0 until pit devlopment commences and then estimated at 240 gpm for Bell and Springer Pits and 450 gpm for Wight Pit once they are fully developed.
* All waste rock will be placed in the Northeast RDS and the North and East RDS's will not be expanded past the current disturbed area.
* Water from all disturbed areas is captured and directed to the TSF (or Mill). The collection ditches closely surround the disturbed areas.
* Water from undisturbed areas is diverted away from mine features.
* Assumes no groundwater input or seepage to or from Cariboo Pit.

Revision 0 - Issued for Report

TABLE D-1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

SITE WATER BALANCE - NO DISCHARGE
YEAR 3

ASSUMPTIONS:

Solids Content 35%
Tailings S.G. = 2.65
Water Content of Ore = 4%
Dry Density (t/m^3) = 1.4
Initial Volume (m^3) = 4,630,666
Minimum Desired Volume = 1,000,000
Minimum Fresh Water Makeup = 2.4%
Underdrainage Recovery - Back to TSF (m^3)= 0
Initial Volume Cariboo Pit (m^3)= 1,821,540
Intitial Volume Wight Pit = 0
Initial Volume Bell Pit (m^3)= 0
Groundwater Seepage Loss (m^3/month) = 5,840

Discharge from Seepage Pond (Yes/no) no

Runoff Coefficients:

	General	Freshet	Low Flow Period
Unprepared Basin=	0.35	1	0
Tailings Beach =	0.9	0.9	
Open Pit Area=	0.5	0.5	
Undisturbed RDS Areas =	0.24	1	0
Millsite Area =	0.50	0.5	
East RDS -Disturbed =	0.60	1	0
Downstream Tailings Areas =	0.7	1	0
North RDS - Disturbed =	0.8	1	
Northeast RDS - Disturbed =	0.6	1	0

Areas:

Open Pits
Bell Pit (Area A) = 17
Diversion Efficiency = 0%
Springer Pit (Area B) = 36
Diversion Efficiency = 0%
Wight Pit (Area C) = 17
Diversion Efficiency = 0%
Cariboo Pit Area (Area D1) = 31
Cariboo Pit acts as a water storage pond

Rock Disposal Sites (RDS)
East Rock Disposal Site (RDS) - Disturbed (Area E1) = 55
Diversion Efficiency = 0%
East RDS - Undisturbed (Area E2) = 89
Diversion Efficiency = 0%
North RDS - Disturbed (Area F1) = 11
Diversion Efficiency = 100%
North RDS - Undisturbed (Area F2) = 5
Diversion Efficiency = 100%
Northeast RDS -Disturbed Area (Area G1) = 36
Diversion Efficiency = 0%
Northeast RDS - Un-Disturbed Area (Area G2) = 0
Diversion Efficiency = 100%

Mill Site
Millsite Area (Area H) = 59
Diversion Efficiency = 0%

Tailing Storage Facility (TSF)
Total Tailings Facility Area = 235.0
Pond Area (Area I) = 130.0
Beach Area (Area J) = 60.0

Unprepared Area (Area K) = 45.0
Biosolids Stockpile (Area L) = 4
Diversion Efficiency = 0%
Downstream Seepage Pond and Area (Area M) = 13
Diversion Efficiency = 0%

Groundwater Infiltration:		% to TSF
Cariboo Pit Groundwater Infiltration (m^3/mo) =	0	0
(gpm) =	0	
Wight Pit Groundwater Infiltration (m3/mo) =	76,091	100%
(gpm) =	450	
Bell Pit Groundwater Infiltration (m3/mo) =	16,909	100%
(gpm) =	100	
Springer Pit Groundwater Infiltration (m3/mo) =	13,527	100%
(gpm) =	60	

Note:
Water that reports to Cariboo Pit is stored in place and does not enter the TSF.
Assumes no groundwater infiltration or seepage.

Water Pumped to Other Pits from the TSF

To Wight Pit (m3/year) = 0
To Cariboo Pit (m3/year) = 0
To Bell Pit (m3/year) = 0

Water Pumped to the TSF from Cariboo Pit
To TSF (m3/year) = 500,000

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DESCRIPTION	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	ANNUAL
Daily Ore Throughput (tpd) =	18888	18888	18888	18888	18888	18888	18888	18888	18888	18888	18888	18888	
	2007												
Precipitation (mm/month)	64	64	64	38	30	40	55	111	80	91	47	57	740
% of Annual Precipitation	8.6%	8.7%	8.7%	5.1%	4.1%	5.4%	7.4%	15.0%	10.8%	12.2%	6.3%	7.7%	100%
Evaporation (mm/month)	0.0	0.0	0.0	0.0	0.0	0.0	47.0	112.0	107.0	92.0	50.0	15.0	423
Days per Month	30.0	31.0	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	365
<WATER INTO TAILINGS IMPOUNDMENT> (m^3)													
Open Pits													
Bell Pit (Area 7a)	5,433	0	0	0	3,961	10,440	10,311	9,452	6,806	7,701	3,962	4,833	62,900
Bell Pit Groundwater	16,364	16,909	16,909	15,273	16,909	16,364	16,909	16,364	16,909	16,909	16,364	16,909	199,091
Springer Pit (Area 11)	11,506	0	0	0	8,387	22,108	21,834	20,017	14,413	16,308	8,391	10,235	133,200
Springer Pit Groundwater	13,091	13,527	13,527	12,218	13,527	13,091	13,527	13,091	13,527	13,527	13,091	13,527	159,273
Wight Pit (Area 12)	5,433	0	0	0	3,961	10,440	10,311	9,452	6,806	7,701	3,962	4,833	62,900
Wight Pit Groundwater	73,636	76,091	76,091	68,727	76,091	73,636	76,091	73,636	76,091	76,091	73,636	76,091	895,909
Rock Disposal Sites (RDS)													
East RDS - Disturbed (Area 5a)	21,094	0	0	0	25,628	67,554	66,716	0	0	0	0	0	180,992
East RDS - Undisturbed (Area 5b)	13,654	0	0	0	41,471	109,314	107,959	0	0	0	0	0	272,398
North RDS - Disturbed (Area 7b)	0	0	0	0	0	0	0	0	0	0	0	0	0
North RDS Undisturbed (Area 7b)	0	0	0	0	0	0	0	0	0	0	0	0	0
Northeast RDS - Disturbed (Area 13a)	13,807	0	0	0	16,775	44,217	43,669	0	0	0	0	0	118,468
Northeast RDS - Undisturbed (Area 13b)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mill Site													
With Slurry	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	12,803,366
Mill Site (Area 6)	18,857	0	0	0	13,746	36,233	35,784	32,805	23,621	26,727	13,752	16,775	218,300
Tailings Storage Facility (TSF)													
Tailings Pond Precipitation (Area 1)	83,098	83,260	82,784	49,072	39,064	52,114	71,646	144,566	104,092	117,779	60,601	73,923	962,000
Tailings Beach Runoff (Area 2)	34,518	0	0	0	25,162	66,325	65,503	60,051	43,238	48,923	25,173	30,706	399,600
Unprepared Area Tailings Facility (Area 3)	10,068	0	0	0	20,969	55,271	54,586	0	0	0	0	0	140,893
Biosolids Stockpile (Area 4)	1,534	0	0	0	1,118	2,948	2,911	2,669	1,922	2,174	1,119	1,365	17,760
Downstream Seepage Pond and Area (Area 9)	5,817	0	0	0	6,058	15,967	15,769	0	0	0	0	0	43,611
>>> Total	1,394,658	1,256,734	1,256,259	1,212,238	1,379,774	1,662,970	1,680,473	1,449,051	1,374,372	1,400,787	1,286,999	1,316,146	16,670,660
<WATER OUT OF TAILINGS IMPOUNDMENT> (m^3)													
Unrecoverable Water													
(-) Seepage Loss	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	70,080
(-) Water Retained in Tailings	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	2,322,817
(-) Evaporation from Supernatant Pond	0	0	0	0	0	0	61,100	145,600	139,100	119,600	65,000	19,500	549,900
(-) Groundwater and Seepage dicharge	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) TSF Surface Runoff discharged from the Seepage Pond	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total	199,408	199,408	199,408	199,408	199,408	199,408	260,508	345,008	338,508	319,008	264,408	218,908	2,942,797
Recoverable Water													
(-) Water Recycled to Mill + Dust Control Requirement (taken from Pit Water)	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	12,366,303
(+/-) Pond Water Accumulating or Lost	177,424	39,301	36,825	-5,196	162,341	445,538	376,940	61,018	-7,182	38,754	-20,435	54,212	1,361,560
(-) Discharge to Caribou Pit	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Water Pumped to Wight Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Water Pumped to Bell Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Discharge from Seepage Recycle Ponds	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total	1,195,450	1,057,326	1,056,850	1,012,830	1,180,366	1,463,562	1,419,965	1,104,043	1,035,864	1,081,779	1,022,591	1,097,238	13,727,863
>>> Total	1,394,858	1,256,734	1,256,259	1,212,238	1,379,774	1,662,970	1,680,473	1,449,051	1,374,372	1,400,787	1,286,999	1,316,146	16,670,660
Monthly Water Available (excluding stored water in the TSF)	1,195,450	1,057,326	1,056,850	1,012,830	1,180,366	1,463,562	1,419,965	1,104,043	1,035,864	1,081,779	1,022,591	1,097,238	13,727,863
Available Stored Water in TSF at Beginning of Month	4,630,666	4,849,757	4,930,725	5,011,217	5,047,688	5,251,696	5,738,899	6,157,505	6,260,190	6,294,695	6,375,116	6,396,348	
Total Monthly Water Available	5,826,116	5,907,084	5,987,576	6,024,047	6,228,054	6,715,258	7,158,864	7,261,548	7,296,054	7,376,474	7,397,706	7,493,585	80,672,366
Water Required at Millsite													
Water for slurry	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	12,803,366
(-) Minimum Fresh Water Input to Mill (from groundwater wells)	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	307,281
(-) Water in Ore	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	279,782
Total Water Recycled to Mill	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	12,216,303
Water for Dust Control on Roads	0	0	0	0	0	0	25,000	25,000	25,000	25,000	25,000	25,000	150,000
Total Water Required	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	12,366,303
Water Surplus (Deficit) After Recycle to Process	177,424	39,301	38,825	(5,196)	162,341	445,536	376,940	61,018	(7,162)	38,754	(20,435)	54,212	1,361,560
Annual Cumulative Surplus (Deficit)	177,424	216,725	255,551	250,355	412,696	858,233	1,235,172	1,296,190	1,289,029	1,327,783	1,307,348	1,361,560	
<CARIBOO PIT> (m^3)													
Water Stored in Cariboo Pit at the Beginning of the Month	1,821,540	1,799,689	1,758,022	1,716,356	1,674,689	1,647,467	1,643,876	1,625,243	1,583,330	1,533,315	1,491,214	1,448,499	
Cariboo Pit Precipitation (Area 8)	19,816	0	0	0	14,445	38,076	37,604	34,474	24,822	28,086	14,451	17,628	229,400
Cariboo Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Cariboo Pit Evaporation	0	0	0	0	0	0	14,570	34,720	33,170	28,520	15,500	4,650	131,130
Water Pumped to the TSF from Cariboo Pit	41,667	41,667	41,667	41,667	41,667	41,667	41,667	41,667	41,667	41,667	41,667	41,667	500,000
Water Pumped to Cariboo Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Stored in Cariboo Pit at the End of the Month	1,799,689	1,758,022	1,716,356	1,674,689	1,847,467	1,843,876	1,625,243	1,583,330	1,533,315	1,491,214	1,448,499	1,419,810	1,419,810
<WIGHT PIT> (m^3)													
Water Stored in Wight Pit at the Beginning of the Month	0	0	0	0	0	0	0	0	0	0	0	0	
Wight Pit Precipitation	0	0	0	0	0	0	0	0	0	0	0	0	0
Wight Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Wight Pit Evaporation	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Pumped to Wight Pit from the Northeast RDS	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Pumped to Wight Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Stored in Wight Pit at tha End of the Month	0	0	0	0	0	0	0	0	0	0	0	0	0
<BELL PIT> (m^3)													
Water Stored in Bell Pit at the Beginning of the Month (pumped to TSF)	0	0	0	0	0	0	0	0	0	0	0	0	
Bell Pit Precipitation	0	0	0	0	0	0	0	0	0	0	0	0	0
Bell Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Bell Pit Evaporation	0	0	0	0	0	0	0	0	0	0	0	0	0
Wator Pumped to Bell Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Stored in Bell Pit at the End of the Month	0	0	0	0	0	0	0	0	0	0	0	0	0
Water in TSF at End of Month	4,849,757	4,930,725	5,011,217	5,047,688	5,251,696	5,738,899	6,157,505	6,260,190	6,294,695	6,375,116	6,396,348	6,492,227	6,492,227

Notes:
* The Bell Pit is already largely developed and will be developed to its ultimate surface area in Year 1. The pit is assumed to already be producing groundwater at its ultimate rate.
* The Wight Pit will be developed in Year 1. It's ultimate surface area will be disturbed Year 1 and it's ultimate depth will be reached in Year 3.
* The Springer Pit is developed in Year 2. It's ultimate surface Area is disturbed in Year 2 and its ultimate depth is reached in Year 7.
* The Northeast Rock Disposal Site (RDS) is developed in Year 1 to its ultimate surface area.
* Groundwater inflow to the pit is assumed to relate to pit depth, and therefore development time, so yearly inflow rates are estimated using a linear relationship between time and inflow rate.
* Groundwater infiltration is assumed to be 0 until pit devlopment commences and then estimated at 240 gpm for Bell and Springer Pits and 450 gpm for Wight Pit once they are fully developed.
* All waste rock will be placed in the Northeast RDS and the North and East RDS's will not be expanded past the current disturbed area.
* Water from all disturbed areas is captured and directed to the TSF (or Mill). The collection ditches closely surround the disturbed areas.
* Water from undisturbed areas is diverted away from mine features.
* Assumes no groundwater input or seepage to or from Cariboo Pit.

Revision 0 - Issued for Report

TABLE D-1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

SITE WATER BALANCE - NO DISCHARGE
YEAR 4

ASSUMPTIONS:

Solids Content 35%
Tailings S.G. = 2.65
Water Content of Ore = 4%
Dry Density (t/m^3) = 1.4
Initial Volume (m^3) = 6,492,227
Minimum Desired Volume = 1,000,000
Minimum Fresh Water Makeup = 2.4%
Underdrainage Recovery - Back to TSF (m^3)= 0
Initial Volume Cariboo Pit (m^3)= 1,419,810
Intitial Volume Wight Pit = 0
Initial Volume Bell Pit (m^3)= 0
Groundwater Seepage Loss (m^3/month) = 5,840

Discharge from Seepage Pond (Yes/no) no

Runoff Coefficients:

	General	Freshet	Low Flow Period
Unprepared Basin=	0.35	1	
Tailings Beach =	0.9	0.9	
Open Pit Area=	0.5	0.5	
Undisturbed RDS Areas =	0.24	1	0
Millsite Area =	0.50	0.5	
East RDS -Disturbed =	0.60	1	0
Downstream Tailings Areas =	0.7	1	
North RDS - Disturbed =	0.6	1	
Northeast RDS - Disturbed =	0.6	1	0

Areas:

Open Pits
Bell Pit (Area A) = 17
Diversion Efficiency = 100%
Springer Pit (Area B) = 35
Diversion Efficiency = 0%
Wight Pit (Area C) = 17
Diversion Efficiency = 100%
Cariboo Pit Area (Area D1) = 31
Cariboo Pit acts as a water storage pond

Rock Disposal Sites (RDS)
East Rock Disposal Site (RDS) - Disturbed (Area E1) = 55
Diversion Efficiency = 0%
East RDS - Undisturbed (Area E2) = 89
Diversion Efficiency = 0%
North RDS - Disturbed (Area F1) = 13
Diversion Efficiency = 100%
North RDS - Undisturbed (Area F2) = 3
Diversion Efficiency = 100%
Northeast RDS -Disturbed Area (Area G1) = 36
Diversion Efficiency = 100%
Northeast RDS - Un-Disturbed Area (Area G2) = 0
Diversion Efficiency = 100%

Pit Filling
Pit Filling
Runoff diverted to Wight Pit

Mill Site
Millsite Area (Area H) = 59
Diversion Efficiency = 0%

Tailing Storage Facility (TSF)
Total Tailings Facility Area = 235.0
Pond Area (Area I) = 135.0
Beach Area (Area J) = 58.0

Unprepared Area (Area K) = 42.0
Biosolids Stockpile (Area L) = 4
Diversion Efficiency = 0%
Downstream Seepage Pond and Area (Area M) = 13
Diversion Efficiency = 0%

	Groundwater Pumping Rate to th	% to TSF	
Cariboo Pit Groundwater Infiltration (m^3/mo) =	0	0	
(gpm) =	0		
Wight Pit Groundwater Infiltration (m3/mo) =	76,091	0%	Pit Filling
(gpm) =	450		
Bell Pit Groundwater Infiltration (m3/mo) =	16,909	0%	Pit Filling
(gpm) =	100		
Springer Pit Groundwater Infiltration (m3/mo) =	20,291	100%	
(gpm) =	120		

Note:
Water that reports to Cariboo Pit is stored in place and does not enter the TSF.

Water Pumped to Other Pits from the TSF

To Wight Pit (m3/year) = 0
To Cariboo Pit (m3/year) = 0
To Bell Pit (m3/year) = 0

Water Pumped to the TSF from Cariboo Pit
To TSF (m3/year) = 0

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Daily Ore Throughput (tpd) =	18888	18888	18888	18888	18888	18888	18888	18888	18888	18888	18888	18888	
	2008												
DESCRIPTION	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	ANNUAL
Precipitation (mm/month)	64	64	64	38	30	40	55	111	80	91	47	57	740
% of Annual Precipitation	8.6%	8.7%	8.7%	5.1%	4.1%	5.4%	7.4%	15.0%	10.8%	12.2%	6.3%	7.7%	100%
Evaporation (mm/month)	0.0	0.0	0.0	0.0	0.0	0.0	47.0	112.0	107.0	92.0	50.0	15.0	423
Days per Month	30.0	31.0	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	365
<WATER INTO TAILINGS IMPOUNDMENT> (m^3)													
Open Pits													
Bell Pit (Area 7a)	0	0	0	0	0	0	0	0	0	0	0	0	0
Bell Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Springer Pit (Area 11)	11,506	0	0	0	8,387	22,108	21,834	20,017	14,413	16,308	8,391	10,235	133,200
Springer Pit Groundwater	19,636	20,291	20,291	18,327	20,291	19,636	20,291	19,636	20,291	20,291	19,636	20,291	238,909
Wight Pit (Area 12)	0	0	0	0	0	0	0	0	0	0	0	0	0
Wight Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Rock Disposal Sites (RDS)													
East RDS - Disturbed (Area 5a)	21,094	0	0	0	25,628	67,554	66,716	0	0	0	0	0	180,992
East RDS - Undisturbed (Area 5b)	13,654	0	0	0	41,471	109,314	107,959	0	0	0	0	0	272,398
North RDS - Disturbed (Area 7b)	0	0	0	0	0	0	0	0	0	0	0	0	0
North RDS Undisturbed (Area 7b)	0	0	0	0	0	0	0	0	0	0	0	0	0
Northeast RDS - Disturbed (Area 13a)	0	0	0	0	0	0	0	0	0	0	0	0	0
Northeast RDS - Undisturbed (Area 13b)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mill Site													
With Slurry	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	12,803,366
Mill Site (Area 6)	18,857	0	0	0	13,746	36,233	35,784	32,805	23,621	26,727	13,752	16,775	218,300
Tailings Storage Facility (TSF)													
Tailings Pond Precipitation (Area 1)	86,295	86,462	85,968	50,960	40,567	54,118	74,402	150,127	108,095	122,309	62,932	76,766	999,000
Tailings Beach Runoff (Area 2)	33,367	0	0	0	24,324	64,114	63,320	58,049	41,797	47,293	24,334	29,683	386,280
Unprepared Area Tailings Facility (Area 3)	9,397	0	0	0	19,571	51,586	50,947	0	0	0	0	0	131,500
Biosolids Stockpile (Area 4)	1,534	0	0	0	1,118	2,948	2,911	2,669	1,922	2,174	1,119	1,365	17,760
Downstream Seepage Pond and Area (Area 9)	5,817	0	0	0	6,058	15,967	15,769	0	0	0	0	0	43,611
>>> Total	1,288,104	1,173,700	1,173,206	1,136,234	1,268,108	1,510,527	1,526,880	1,350,250	1,277,086	1,302,048	1,197,111	1,222,062	15,425,316
<WATER OUT OF TAILINGS IMPOUNDMENT> (m^3)													
Unrecoverable Water													
(-) Seepage Loss	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	5,840	70,080
(-) Water Retained in Tailings	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	193,568	2,322,817
(-) Evaporation from Supernatant Pond	0	0	0	0	0	0	63,450	151,200	144,450	124,200	67,500	20,250	571,050
(-) Groundwater and Seepage dicharge	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) TSF Surface Runoff discharged from the Seepage Pond	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total	199,408	199,408	199,408	199,408	199,408	199,408	262,858	350,608	343,858	323,608	266,908	219,658	2,963,947
Recoverable Water													
(-) Water Recycled to Mill + Dust Control Requirement (taken from Pit Water)	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	12,366,303
(+/-) Pond Water Accumulating or Lost	70,670	-43,733	-44,227	-81,199	50,674	293,094	220,997	-43,383	-109,798	-64,585	-112,822	-40,621	95,066
(-) Discharge to Caribou Pit	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Water Pumped to Wight Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Water Pumped to Bell Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Discharge from Seepage Recycle Ponds	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total	1,088,696	974,292	973,798	936,826	1,068,700	1,311,119	1,264,022	999,642	933,228	978,440	930,203	1,002,404	12,461,369
>>> Total	1,288,104	1,173,700	1,173,206	1,136,234	1,268,108	1,510,527	1,526,880	1,350,250	1,277,086	1,302,048	1,197,111	1,222,062	15,425,316
Monthly Water Available (excluding stored water in the TSF)	1,088,696	974,292	973,798	936,826	1,068,700	1,311,119	1,264,022	999,642	933,228	978,440	930,203	1,002,404	12,461,369
Available Stored Water in TSF at Beginning of Month	6,492,227	6,562,897	6,519,164	6,474,937	6,393,738	6,444,412	6,737,506	6,958,502	6,915,119	6,805,321	6,740,736	6,627,914	
Total Monthly Water Available	7,580,922	7,537,189	7,492,962	7,411,763	7,462,437	7,755,531	8,001,527	7,958,144	7,848,347	7,783,762	7,670,939	7,630,318	92,133,842
Water Required at Millsite													
Water for slurry	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	1,066,947	12,803,366
(-) Minimum Fresh Water Input to Mill (from groundwater wells)	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	25,607	307,281
(-) Water in Ore	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	23,315	279,782
Total Water Recycled to Mill	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	12,216,303
Water for Dust Control on Roads	0	0	0	0	0	0	25,000	25,000	25,000	25,000	25,000	25,000	150,000
Total Water Required	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,018,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	1,043,025	12,366,303
Water Surplus (Deficit) After Recycle to Process	70,670	(43,733)	(44,227)	(81,199)	50,674	293,094	220,997	(43,383)	(109,798)	(64,585)	(112,822)	(40,621)	95,066
Annual Cumulative Surplus (Deficit)	70,670	26,937	(17,290)	(98,489)	(47,815)	245,279	466,275	422,892	313,095	248,510	135,688	95,066	
<CARIBOO PIT> (m^3)													
Water Stored in Cariboo Pit at the Beginning of the Month	1,419,810	1,439,626	1,439,626	1,439,626	1,439,626	1,454,071	1,492,146	1,515,180	1,514,934	1,506,585	1,506,151	1,505,102	
Cariboo Pit Precipitation (Area 8)	19,816	0	0	0	14,445	38,076	37,604	34,474	24,822	28,086	14,451	17,628	229,400
Cariboo Pit Groundwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Cariboo Pit Evaporation	0	0	0	0	0	0	14,570	34,720	33,170	28,520	15,500	4,650	131,130
Water Pumped to the TSF from Cariboo Pit	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Pumped to Cariboo Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Stored in Cariboo Pit at the End of the Month	1,439,626	1,439,626	1,439,626	1,439,626	1,454,071	1,492,146	1,515,180	1,514,934	1,506,585	1,506,151	1,505,102	1,518,080	1,518,080
<WIGHT PIT> (m^3)													
Water Stored in Wight Pit at the Beginning of the Month	0	98,310	188,235	278,081	354,962	449,792	558,740	660,723	718,544	775,077	838,049	904,111	
Wight Pit Precipitation	10,867	0	0	0	7,921	20,880	20,621	18,905	13,612	15,402	7,925	9,667	125,800
Wight Pit Groundwater	73,636	76,091	76,091	68,727	76,091	73,636	76,091	73,636	76,091	76,091	73,636	76,091	895,909
Wight Pit Evaporation	0	0	0	0	0	0	14,570	34,720	33,170	28,520	15,500	4,650	131,130
Water Pumped to Wight Pit from the Northeast RDS	13,807	13,834	13,755	8,154	10,818	14,432	19,840	0	0	0	0	0	94,639
Water Pumped to Wight Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Stored in Wight Pit at the End of the Month	98,310	188,235	278,081	354,962	449,792	558,740	660,723	718,544	775,077	838,049	904,111	985,218	985,218
<BELL PIT> (m^3)													
Water Stored in Bell Pit at the Beginning of the Month (pumped to TSF)	0	27,230	44,139	61,049	76,321	101,152	138,396	161,356	161,905	159,256	163,047	171,835	
Bell Pit Precipitation	10,867	0	0	0	7,921	20,880	20,621	18,905	13,612	15,402	7,925	9,667	125,800
Bell Pit Groundwater	16,364	16,909	16,909	15,273	16,909	16,364	16,909	16,364	16,909	16,909	16,364	16,909	199,091
Bell Pit Evaporation	0	0	0	0	0	0	14,570	34,720	33,170	28,520	15,500	4,650	131,130
Water Pumped to Bell Pit from the TSF	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Stored in Bell Pit at the End of the Month	27,230	44,139	61,049	76,321	101,152	138,396	161,356	161,905	159,256	163,047	171,835	193,761	193,761
Water in TSF at End of Month	6,562,897	6,519,164	6,474,937	6,393,738	6,444,412	6,737,506	6,958,502	6,915,119	6,805,321	6,740,736	6,627,914	6,587,293	6,587,293

Notes:
* The Bell Pit is already largely developed and will be developed to its ultimate surface area in Year 1. The pit is assumed to already be producing groundwater at its ultimate rate.
* The Wight Pit will be developed in Year 1. It's ultimate surface area will be disturbed Year 1 and it's ultimate depth will be reached in Year 3.
* The Springer Pit is developed in Year 2. It's ultimate surface Area is disturbed in Year 2 and its ultimate depth is reached in Year 7.
* The Northeast Rock Disposal Site (RDS) is developed in Year 1 to its ultimate surface area.
* Groundwater inflow to the pit is assumed to relate to pit depth, and therefore development time, so yearly inflow rates are estimated using a linear relationship between time and inflow rate.
* Groundwater infiltration is assumed to be 0 until pit devlopment commences and then estimated at 240 gpm for Bell and Springer Pits and 450 gpm for Wight Pit once they are fully developed.
* All waste rock will be placed in the Northeast RDS and the North and East RDS's will not be expanded past the current disturbed area.
* Water from all disturbed areas is captured and directed to the TSF (or Mill). The collection ditches closely surround the disturbed areas.
* Water from undisturbed areas is diverted away from mine features.
* Assumes no groundwater input or seepage to or from Cariboo Pit.

Revision 0 - Issued for Report

APPENDIX E

Technical Paper on Modified Centreline Construction of Tailings Embankments
(By J.P. Haile & K.J. Brouwer)

(Pages E1 to E7)

Modified Centreline Construction of Tailings Embankments

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Abstract: A new approach to compacted fill embankments for tailings storage facilities has been developed which is seismically stable and minimizes the fill requirements, and hence costs, for embankment construction. Modified centreline construction is similar to conventional centreline construction but with the contact between the compacted fill and the tailings sloping slightly upstream. It is, however, different from upstream construction as the stability of the embankment relies on the relatively wide thickness of compacted fill at any elevation, is independent of the tailings strength and is inherently stable even with complete liquefaction of the tailings mass. The design approach significantly reduces the quantity of fill required for on-going raises compared to conventional centreline and downstream construction as on-going construction on the downstream face is not required. This also allows for reclamation of the downstream embankment face during operations. It has been successfully implemented at the Montana Tunnels Mine in Montana, where a final embankment height of over 100 metres is planned, and forms the basis for the tailings embankment design for new projects in Alaska and British Columbia, Canada. This paper describes the principal features of this construction technique, analytical procedures and case histories.

Key Words: **mine tailings storage, embankment construction, waste reclamation, seismic stability**

1. Introduction

The design of tailings facility embankments in seismically active areas, or for fine-grained, low strength tailings, has historically utilized conventional earth or rockfill embankments constructed as a full embankment section similar to a water retaining dam. No reliance is placed on the strength of the tailings and the embankment section is stable under all conditions of static and seismic loading. In some instances centreline construction using either the coarse fraction of the tailings or compacted fill is used to achieve the same design objectives.

Both of these approaches require a relatively large volume of fill material for the embankment section. With staged construction the volume of fill required for each incremental raise of the embankment crest gets larger as the height of the embankment increases, and requires construction on the downstream face of the embankment over the full height. This has the added disadvantage of not allowing reclamation of the downstream face to be carried out during mining operations. Staged construction of downstream and centreline embankments is shown schematically in Figure 1.

In most instances where these embankment cross-sections are required, upstream construction on the tailings mass itself would not be an appropriate alternative, either because of poor consolidation and/or drainage conditions within the tailings, potential liquefaction and low strength of the tailings. Upstream tailings embankments can only be constructed with fine grained tailings and in seismically active areas if proper measures are taken to ensure full consolidation and drainage of the tailings [1].

The modified centreline embankment, however, offers a cost effective alternative to downstream or centreline construction in areas of high seismic risk and for tailings with little or no strength. This paper describes the principal features of this construction technique, along with analytical procedures and case histories.

3rd International Conference on Environmental Issues and Waste Management in Energy and Mineral Production, August, 1994. Perth, Australia

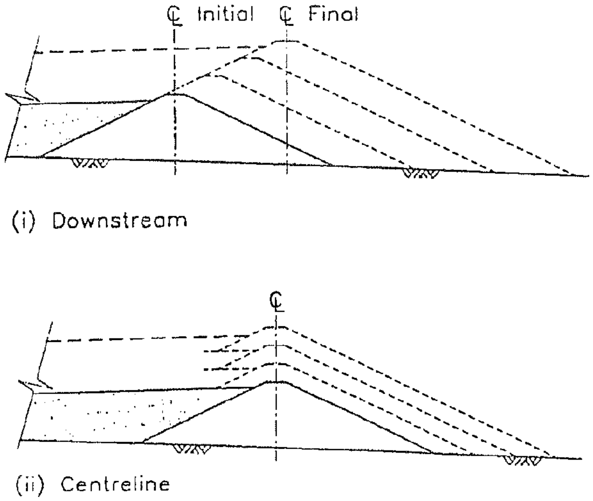


Figure 1 Downstream and centreline embankments

2. Design Concept

The modified centreline cross-section is similar to a centreline cross-section but with the contact between the embankment fill and the tailings sloping slightly upstream. It results in the minimum volume of embankment fill for an embankment that is stable under all conditions of static and seismic loading. Furthermore, on-going construction on the downstream face is not required and reclamation can be carried out during operations. A schematic cross-section through a modified centreline embankment is shown on Figure 2.

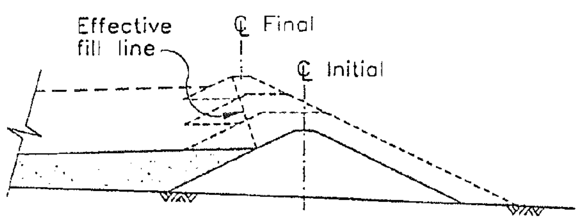


Figure 2 Modified centreline embankment

The modified centreline embankment achieves its stability from the relatively wide thickness of compacted fill at any elevation, and is independent of the strength of the tailings. The embankment is designed to be stable even if the tailings are fully liquefied and imposing both full fluid pressure and hydrodynamic loading on the upstream contact. The upstream contact remains stable even if the tailings are fully liquefied, when they would act as a dense fluid. The analogy is that of a slurry wall, where a dense fluid such as bentonite mud can be used to support very deep excavations.

The construction technique does require some placing of fill on the tailings beach, and hence deposition of at least a portion of the tailings stream from the embankment face is required. Ideally, the beach should be at least strong enough to support the first lift of fill. This can be achieved on very soft tailings with the assistance of a geotextile separation layer. If the beach cannot support the first lift, then the tailings can be displaced using dumped rockfill.

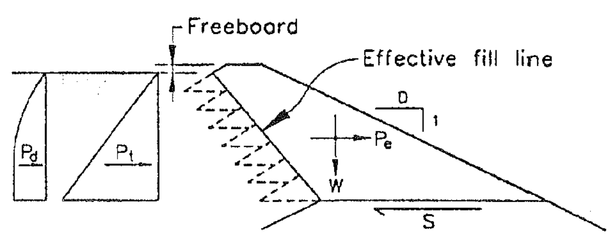
Modified centreline tailings embankments can be designed as either water retaining structures or fully drained embankments. When designed to be water retaining, which is obviously a more severe loading condition than if fully drained, the water retaining zone, or core, should be located as far upstream as possible, in order to provide the necessary width of drained granular material downstream of the core for stability.

3. Stability and Deformation Analyses

Stability analyses of a modified centreline embankment can be considered under three separate headings:
(i) Downstream stability,
(ii) Upstream stability,
(iii) Deformation Analyses.

Downstream Stability

Downstream stability can be analyzed initially as pseudo-static loading on the modified centreline portion of embankment only, i.e. that portion of the embankment above the full section. The forces acting on this section of the embankment are shown schematically on Figure 3.



SUMMARY OF LOADING CONDITIONS	
SYMBOL	DESCRIPTION
P_t	LIQUEFIED TAILINGS
P_d	HYDRODYNAMIC THRUST
P_e	EARTHQUAKE LOADING ON EMBANKMENT
W	WEIGHT OF EMBANKMENT
S	SHEAR RESISTANCE

Figure 3 Downstream pseudo-static loading for stability analyses

In designing a modified centreline embankment the main variables to be considered in the geometry of the section are the height of the modified centreline portion, the downstream slope and the upstream contact slope between the fill and tailings.

The downstream slope will generally be dictated by the construction materials available, but the height of the modified centreline portion and the upstream contact slope will be a function of the seismicity of the site. The height of the modified centreline portion can be considered in terms of Critical Height (H_c), which is defined as that height at which the pseudo-static factor of safety is equal to 1.0 under a given acceleration. The relationships between H_c, acceleration and the upstream contact slope are shown on Figure 4, for a given set of assumptions and the loading conditions shown on Figure 3.

The concepts presented in Figure 4 can be used for an initial determination of H_c. However, it is important to realize that this critical height is not a limiting height and only defines the height at which the critical acceleration for the embankment section k_c, is equal to the design acceleration for the site, a_{max}. Higher embankments, with a value of k_c less than a_{max}, can be safely designed but will be subject to some deformation during the earthquake shaking.

The modified centreline embankment must also incorporate suitable provisions for seepage control and for piping prevention. Since the embankment fill extends slightly over more compressible tailings materials, consolidation settlement may result in cracking of the embankment core zone. Therefore, the embankment design must incorporate suitable filter criteria and drainage provisions. In general, the tailings mass forms an ideal crack stopping filter medium so that piping failure is not a major consideration. Embankment stability can also be enhanced by incorporating drainage features such as chimney drains to reduce pore pressures within the structural zone of the embankment.

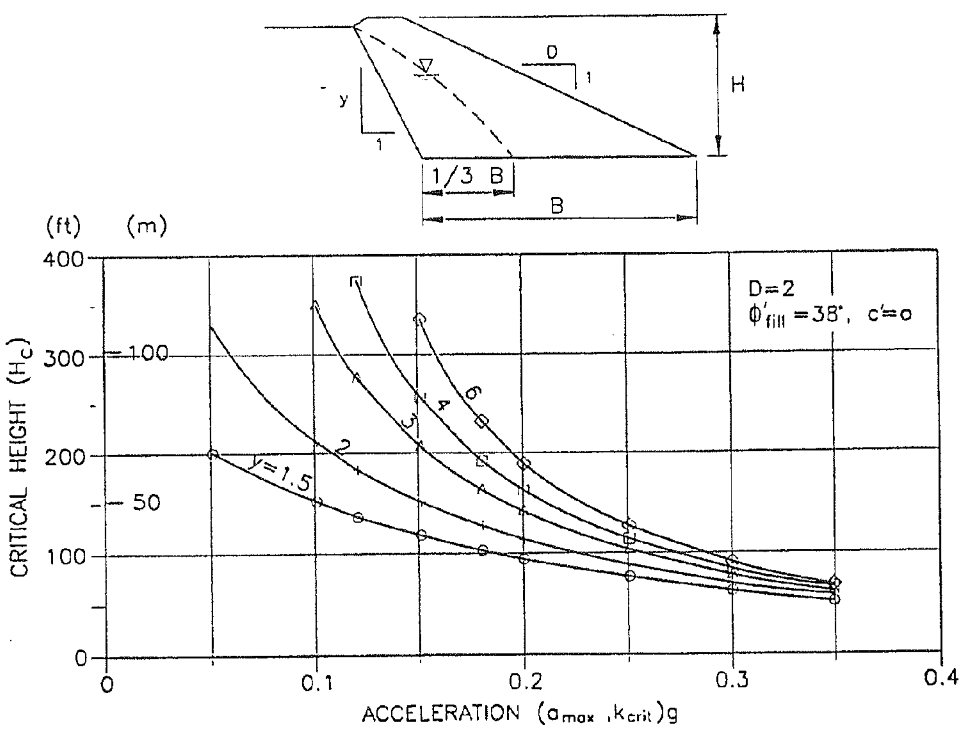
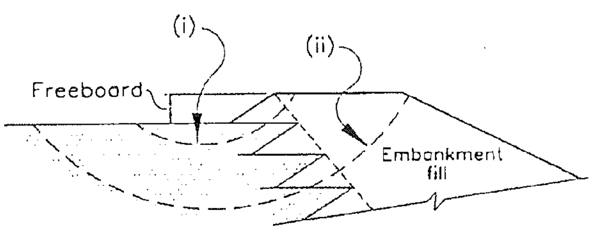


Figure 4 Relationship between critical height and acceleration

Upstream Stability

Upstream stability needs to consider two critical loading conditions: short-term loading on the tailings beach during embankment crest raising; and post-seismic upstream stability when the tailings would have only post liquefaction residual strength. In the first case, the principal concern is safety, whereas for the second case the principal concern is for failures causing loss of freeboard. Both cases need to be analyzed to determine the maximum allowable freeboard, which can then be related to flood storage requirements (Figure 5). In both analyses the appropriate strength characteristics of the tailings need to be known, in addition to those of the embankment fill materials.



(i) Short term construction.
Tailings strength, $c_u/p' \simeq 0.2 - 0.3$

(ii) Post earthquake loss of freeboard.
Tailings residual strength, $c_u/p' \simeq 0.1 - 0.2$

Figure 5 Upstream stability loading cases to determine maximum freeboard

Deformation Analyses

Deformation analyses can be carried out using the simplified procedures of Newmark [2] and Makdisi and Seed[3]. The analyses compare the critical acceleration k_c, with the site design acceleration, a_{max}, and compute displacements using empirical relationships and case history data from conventional water retaining dams. Modification of the amplitude of the ground acceleration as it propagates up through the embankment can be determined using the SHAKE [4] program. Similarly, the value of k_c at any elevation in the embankment can be determined from standard stability analysis programs. In order to compensate for the geometry of the modified centreline embankment and uncertainties in the mode of deformation, the largest value of acceleration determined from SHAKE can be used together with the smallest value of k_c to compute potential deformations.

A pseudo-dynamic finite element displacement analysis has been developed by Byrne *et al* [5,6]. This analysis can be used to determine deformations under both upstream and downstream earthquake loading, and to define the location and magnitude of the largest deformations. In general it predicts deformations somewhat larger than those from the simplified Newmark analyses using the extreme values.

The stability analyses discussed above have only considered the more extreme loading conditions. In all embankment designs, all loading cases must be analyzed using relevant material parameters to ensure that acceptable factors of safety exist for each loading case.

4. Case Histories

Montana Tunnels Mine, Montana, USA.

The Montana Tunnels Mine is an open pit operation which involves processing gold, lead, zinc and silver ore at a rate of approximately 13,700 tonnes per day. The mine has been operating since 1987. Total mineable reserves from inception of mining have recently been expanded from 38 to 62 million tonnes.

The original tailings embankment was designed using a downstream method of construction for the annual staged expansions[7]. The compacted rockfill embankment layout was modified in 1990, when on-going expansions were constructed using the modified centreline method in order to minimize fill quantities and preserve a downstream process water pond[8]. The modified centreline section was changed again in 1993 to enable expansion of the tailings impoundment to provide storage for the increased ore reserves. The embankment is presently designed to reach a maximum ultimate height of 105 metres. A schematic cross-section through the embankment is shown on Figure 6.

The redesign of the modified centreline embankment in 1993 included an extensive site investigation program which incorporated drilling, sampling, standard penetration testing, seismic piezocone testwork and installation of vibrating wire piezometers. A line of wick drains was installed along the tailings beach to enhance drainage into the free-draining embankment. A second wick drain program[9] was also completed within the tailings impoundment to dissipate excess pore pressures, accelerate consolidation and enhance seismic stability.

The stability assessment for the embankment included conventional limit equilibrium analyses for static, pseudo-static and post-earthquake conditions. Additional pseudo-dynamic finite element analyses, using the procedure described by Byrne *et al*[5], were also used to evaluate potential embankment deformations for a maximum credible earthquake with a peak horizontal ground acceleration of 0.22 g. The analysis includes both the inertia forces from the earthquake as well as the softening effect of the soil during cyclic loading. The fifth modified centreline embankment raise will be completed at the Montana Tunnels Mine during 1994, with annual expansions planned through 2001.

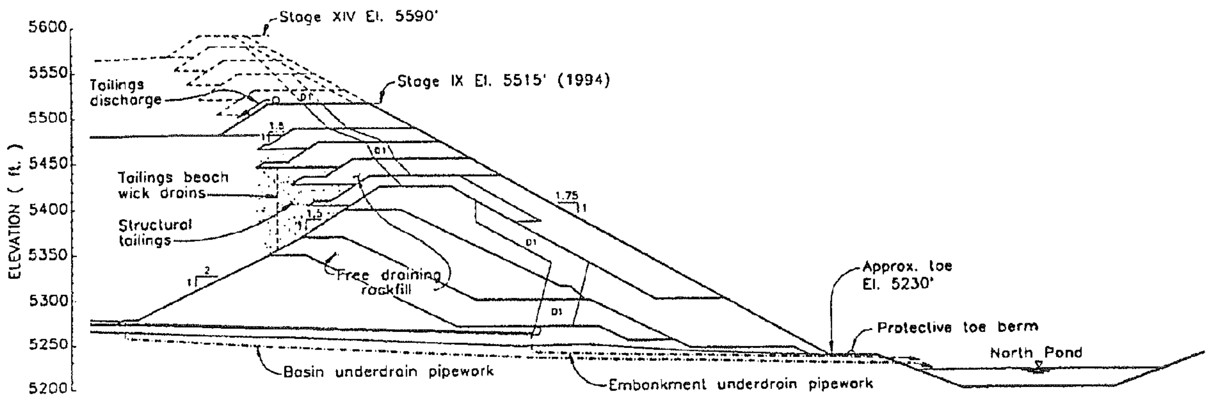


Figure 6 Typical section through Montana Tunnels embankment

Kensington Venture, Alaska, USA

The Kensington Project is a proposed underground gold mine located 40 miles north of Juneau, Alaska, on the east side of the Lynn Canal. The mine will require construction of a 89 metre high dam to contain the tailings from the mining operations. The dam is to be constructed in stages using compacted earthfill and rockfill and a modified centreline arrangement. The project is located in an area of high potential seismicity and earthquake-induced liquefaction of the tailings is possible. The stability of the top portion of the dam and the potential displacements resulting from earthquake loading are therefore of extreme importance. A cross-section through the proposed final embankment is shown on Figure 7.

Conventional limit equilibrium and Newmark analyses, including hydrodynamic loading from the liquefied tailings, indicate that the embankment is stable and deformations would be very small. Deformation analyses were also carried out using the pseudo-dynamic finite element procedure developed by Byrne *et al* [5]. The analysis allows both the inertia forces from the earthquake as well as the softening effect of the liquefied soil to be considered.

Peak horizontal ground accelerations ranging from 0.2 g to 0.6 g were considered with corresponding peak ground velocities of 0.2 and 0.6 metre/second. The predicted peak displacements of the crest of the dam are 0.48 metre horizontal and 0.09 metre vertical. The maximum movement of the dam predicted from the Newmark analysis using the same soil strengths was 0.14 metres.

The Kensington Venture is currently in the final stages of permitting.

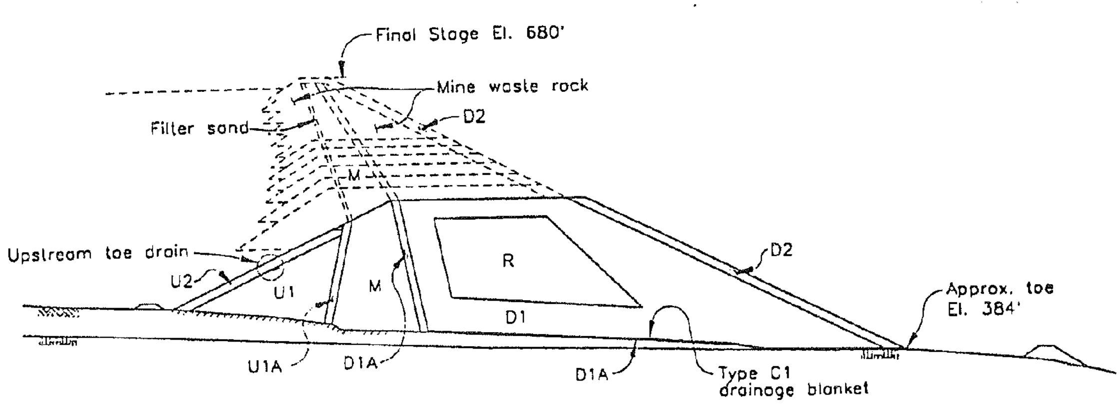


Figure 7 Typical section through Kensington embankment

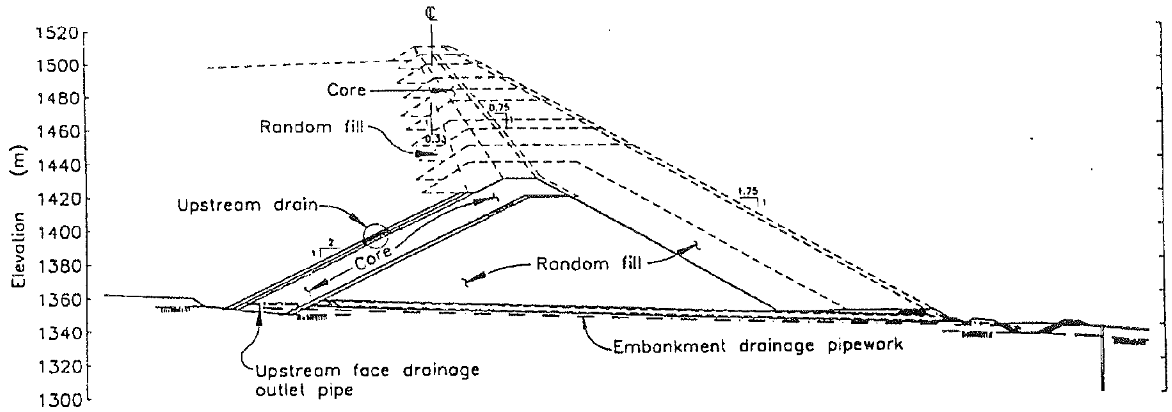


Figure 8 Typical section through Kemess South embankment

Kemess South Project, B.C., Canada

The Kemess South Project, situated in north central British Columbia, is presently in the final stages of permitting and is scheduled for development in 1995. A total reserve of 220 million tonnes of gold and copper ore will be processed at a rate of 40,000 tonnes per day. The project will include the staged construction of a compacted earthfill tailings embankment using the modified centreline technique to an ultimate height of 150 metres. A schematic embankment section is shown on Figure 8.

The project site is situated in an area of low seismicity and conventional pseudo-static limit equilibrium analyses indicate an adequate factor of safety against embankment deformation. The modified centreline embankment section was selected in order to minimize the quantity of fill required for staged expansions, and thus reduce on-going capital expenditures. Also, the downstream face of the embankment will be incrementally revegetated to minimize environmental impacts during operations and to reduce post-closure reclamation requirements.

5. Conclusions

The modified centreline embankment provides the least cost compacted fill embankment for tailings storage facilities in areas of high seismicity and for low strength tailings. These embankments are intrinsically stable under earthquake loading even with the tailings fully liquified. They can be constructed in stages using standard mining equipment and overburden materials from on-going mining operations. After the initial one or two stages no further construction is required on the downstream face, which allows for on-going reclamation during operations.

The modified centreline design has been successfully implemented at the Montana Tunnels Mine in Montana, where a final embankment height of over 100 metres is planned. A detailed design has been developed for the Kensington Venture in Alaska and is in the final stages of the review process. Designs for new projects in B.C. and elsewhere in North America are currently at the development stage.

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APPENDIX F

TYPICAL TECHNICAL SPECIFICATIONS

Tender Document for Stage 3C Tailings Storage Facility Construction
– Technical Specification

(Pages F1 to F23)

PART 7 – TECHNICAL SPECIFICATIONS

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PART 7 - TECHNICAL SPECIFICATIONS

7.1 MOBILIZATION AND DEMOBILIZATION

7.1.1 Scope Of Work

The Work in this section comprises the establishment on the Site of all the temporary accommodation, Plant and equipment necessary for the successful performance and completion of the Work and shall include, but not necessarily be limited to:

a. Assemble all necessary Plant and equipment and transport it to the Site.
b. Establish all the Contractor's maintenance facilities, construction roads, temporary workshops, office accommodation and sanitation facilities on the Site.
c. Provide adequate sediment control measures during the Work.
d. Maintain all Plant and services for the duration of the Work.
e. On completion of the Work, remove all Plant, temporary facilities from the Site and clean up and leave the Site in a clean and tidy condition to the satisfaction of the Owner.

7.1.2 Mobilization

In accordance with the Construction Schedule, or as otherwise agreed in writing with the Owner, following award of the Contract, the Contractor shall mobilize on the Site, sufficient labour, materials, Plant and equipment to enable the Work to commence, and shall bring on to the Site as and when necessary, any additional labour, materials, Plant and equipment which may be required from time to time to complete the Work in accordance with the construction schedule.

7.1.3 Contractor's Laydown Area

The Contractor shall erect, in the area designated by the Owner, adequate workshops, offices, laydown areas and other buildings and structures for the completion of the Work as designated in the Special Conditions. Such workshops and offices, etc., shall be maintained in a neat and tidy condition throughout the duration of the Work to the satisfaction of the Engineer and Owner.

7.1.4 Sanitation

The Contractor shall provide and maintain adequate sanitary facilities for his personnel at the Site in compliance with local health regulations and to the satisfaction of the Owner.

7.1.5 Construction Roads

All temporary construction roads that the Contractor may require to complete the Work shall be constructed at the Contractor's expense. The location of any temporary roads, or portions thereof, on the Site shall be subject to the Owner's and Engineer's approval.

7.1.6 Sediment Control

The Contractor shall be responsible for erosion protection and prevention of water pollution during the Work as outlined in the Clause 6.5.e of the Special Conditions.

7.1.7 Demobilization

On completion of the Work the Contractor shall remove all Plant, temporary facilities and equipment from the Site and leave it in a clean and tidy state to the satisfaction of the Owner.

7.1.8 Measurement and Payment

Payment for mobilization will be made under the lump sum price entered under Item 1.a of Schedule B. This lump sum price shall include payment for mobilization of all Plant and everything required by the Special Conditions to be performed or carried out at the site. This lump sum price shall not exceed 4 percent of the total Tender Price. Payment of this item will be made thirty(30) days after mobilization on the Site is substantially complete and Work has commenced.

Payment for demobilization will be made under the lump sum price entered under Item 1.b of Tender Schedule B. This lump sum price shall not be less than 4 percent of the total Tender Price. Such payment will be made thirty (30) days after all Plant and temporary facilities have been removed from the Site and the Owner is satisfied with the clean-up and condition of the Site.

7.2 EARTHWORKS

7.2.1 Scope of Work

The portion of Work specified in this Section shall consist of supplying all labour, supervision equipment and materials necessary to construct and protect the earthworks as shown on the Drawings or as required by the Engineer including:

a. Clear, grub and remove topsoil and unsuitable material from the Stage 3C work area as defined on the Drawings.
b. Prepare the foundation areas for construction of the Stage 3C embankments.
c. Construct the raise to the Main, Perimeter and South Embankments using the materials generated from borrow areas and stockpiles, as shown on the Drawings.

7.2.2 Clearing, Grubbing and Removal of Topsoil and/or Unsuitable Material

The Contractor shall clear, grub and remove topsoil and/or unsuitable material from all ground surfaces prior to excavation in any area, in areas which are not excavated but in which fill is to be placed, to the limits as shown on the Drawings.

In order to reduce erosion and contamination of the surface runoff to a minimum at all times, clearing, grubbing and topsoil removal shall be scheduled to be performed only as and when required to enable each portion of the Work to be carried out.

a. Clearing and Grubbing

The Work area will have been logged of merchantable timber prior to the Contractor arriving on site. Clearing the areas of the Site so designated on the Drawings or in the Technical Specifications shall consist of the felling of all non-merchantable trees, shrubs and vegetation to within 0.6 m of the ground surface.

All non-merchantable timber and vegetation shall be disposed of by burning to reduce it to ashes or as otherwise approved by the Owner. Care shall be taken in burning debris to prevent the fire from spreading. Prior to starting any fires the Contractor shall notify the Owner and the governmental authority having jurisdiction with regard to fires and shall obtain their permission to proceed.

General requirements regarding prevention and control of fires are covered in the General Conditions. At all times during which burning takes place, the Contractor shall have available in working order to control the fire sufficient fire fighting equipment and personnel to operate such equipment.

Any clearing which the Contractor elects to perform for his own purposes, and for which he will not be paid, shall be subject to the approval of the Owner and shall be performed in accordance with the requirements of this Clause. Prior to the clearing of any area, which is not required for the Work, the Contractor shall submit to the Owner for approval, full details of the clearing it proposes to perform. Clearing in any such area shall not be commenced prior to receipt of written approval by the Owner.

Grubbing of the selected areas of the Site shown on the Drawings shall consist of the complete removal of all vegetation and organic matter and grubbing to remove all roots and stumps. All roots over 50 mm in diameter, protruding from the ground surface, shall be grubbed to a depth of 300 mm below the ground surface. Pieces of wood less than 75 mm in diameter, 1000 mm in length may be scattered within the clearing limits and will be incorporated with the topsoil during topsoil stripping operations by the Contractor.

All vegetable matter, roots and stumps so produced shall be disposed of in the same manner as that specified for non-merchantable debris in (a) above. Muskeg or peats which cannot be burned shall be temporarily stockpiled or windowed within the work area and shall ultimately be disposed of by placing in designated stockpiles or exhausted borrow areas and covering with fill material.

b. Removal of Topsoil and/or Unsuitable Material

After an area has been cleared and grubbed, and the debris removed, the Contractor shall remove the topsoil and/or unsuitable materials and stockpile this material in the designated areas as shown on the Drawings.

Unsuitable material shall be identified by the Engineer and will generally comprise saturated soils, ash, or fill materials which when compacted do not achieve the designated density.

The material is to be stockpiled in a neat workmanlike manner approved by the Engineer such that it shall be stable and protected from erosion. Soil covers shall be required on stockpiles as directed by the Engineer.

After removal of surface soil and/or unsuitable material in an area and before any additional work is undertaken:

(i) the Engineer shall inspect the area to determine whether removal of material has been completed satisfactorily,
(ii) the Engineer shall determine the type of surface treatment to follow, for the particular area, and
(iii) a survey will be taken of the area in order to determine quantities and/or verify lift/layer thickness.

c. Removal of Unsuitable Material from Embankment Slopes

The Contractor shall remove unsuitable materials from the existing embankment slopes and stockpile this material in the designated areas as shown on the Drawings or as otherwise directed by the Owner.

Unsuitable material shall be identified by the Engineer and will generally comprise saturated fill materials, which when compacted do not achieve the designated density.

The material is to be stockpiled in a neat workmanlike manner approved by the Engineer such that it shall be stable and protected from erosion. Soil covers shall be required on stockpiles as directed by the Engineer.

After removal of unsuitable material in an area and before any additional work is undertaken:

(i) the Engineer shall inspect the area to determine whether removal of material has been completed satisfactorily,
(ii) a survey will be taken of the area to determine quantities and/or verify lift/layer thickness.

The fill shall be keyed into the existing embankment slopes by cutting vertical steps into the slope equal in height to the lift thickness of the fill being placed.

7.2.3 Removal of Temporary Cover

The Contractor shall remove any temporary soil cover spread during the previous stage of construction for protection purposes.

Temporary protected areas are those where previous soil cover shall be removed to the required depth for proper connection between the "As Constructed" and "Designed" section according to latest revised drawings or upon the discretion of the Engineer during construction.

7.2.4 Open Excavation

a. General

The Contractor shall develop its excavation methods, techniques and procedures with due consideration of the nature of the materials to be excavated and shall take such precautions as are necessary to preserve in an undisturbed condition all materials outside the lines and grades shown on the Drawings. The Contractor shall be permitted to carry out excavation, shaping, etc. by whatever method it considers most suitable, providing it is consistent with producing an acceptable end result as determined by the Owner or Engineer. The Contractor shall be solely responsible for the safety and adequacy of the methods employed.

The Contractor shall notify the Engineer after clearing, grubbing, and removing topsoil and unsuitable material from an area, and shall obtain the Engineer's approval of the adequacy of the exposed surface prior to the Contractor excavating below or placing material on the surface.

After the completion of clearing, grubbing and removal of topsoil and unsuitable material from an area, and after excavation of all material, prior to further excavation of any material for which the Contractor expects payment on a unit price basis, the existing ground surfaces shall be established on the basis of surveys to be made by the Contractor for purposes of measurement for payment. Prior to commencement of such surveys of any particular area the Contractor shall notify the Owner, so as to give the Owner the opportunity of participating in, or directing, the carrying out of such surveys. In any event, the Contractor shall not proceed to excavate any material prior to receipt, in writing from the Owner or Engineer of his agreement with the location of the existing ground surface in that area. Failure by the Contractor to comply with the above requirements with respect to excavation in any area shall mean that the location of the existing surface in such an area, for the purpose of measurement, shall be decided solely by the Owner.

The Contractor, in its scheduling of the Work, shall allow sufficient time in its construction schedule for the carrying out of the surveys defined above and for the Owner's or Engineer's proper consideration thereof prior to his authorization to proceed with excavation in any area.

The Contractor shall not excavate beyond the lines and grades shown on the Drawings without the prior written approval of the Engineer. Any additional excavation which is performed by the Contractor for any purpose or reason whatsoever, other than in compliance with a specific request from the Owner or Engineer, shall be carried out at the expense of the Contractor. If such additional excavation, as defined herein, should in the opinion of the Engineer require backfilling in order to satisfactorily complete the Work, such backfilling shall be done by and at the expense of the Contractor, including the supply of fill material, and shall be completed to the satisfaction of the Engineer.

Where pipe, drain or culvert trenches are to be excavated in fill, excavation shall not commence until the elevation of the compacted fill exceeds the nominal crown elevation of the conduit by at least 300 mm.

The Contractor shall provide, maintain and operate any temporary drainage and/or pumping facilities required to control ground and surface water in order to keep the excavations dry and in a stable condition. The Contractor's dewatering operations shall be accomplished in a manner that shall not adversely affect the stability of the excavated slopes and shall not cause erosion and softening of adjacent materials.

The discharge from any dewatering system shall be directed to appropriate sediment control facilities.

When a section of excavation has been completed to the required lines and grades, the Contractor shall notify the Engineer who shall inspect the Work. Excavated surfaces shall not be covered with pipe bedding, fill, geosynthetics or concrete until the surface has been approved in writing by the Engineer. The Contractor shall uncover at its own expense, any excavated surface which has been covered prior to inspection and approval by the Engineer.

The Contractor shall protect and maintain all excavations until completion of the Work or until such time as the adjacent placement of material has been completed.

Material from the excavations, which meets, or can be processed to meet, the requirements for the construction materials specified in the Tender Documents, shall be either stockpiled for later use, or used directly for construction of the Work. In the event that the Contractor elects to stockpile fill material prior to placing it directly into the fill, the cost of double handling shall be at the Contractor's expense.

Excavated materials not suitable for use in construction shall be disposed of in spoil disposal areas approved by the Owner.

b. Revisions to Lines and Grades

In the event that the Owner or Engineer should in his sole discretion require the Contractor to excavate any part of the Work to lines or grades other than specified, previously directed by the Owner or Engineer, or shown on the Drawings then:

(i) If the Contractor is advised of such requirements before excavation to the lines and grades specified, previously directed by the Owner or Engineer, or shown on the Drawings, such required excavation shall be paid for at the applicable price entered for the excavation in the Schedule of Quantities and Prices.

(ii) If the Contractor is advised of such requirements after excavation to the lines and grades specified, previously directed by the Owner or Engineer, or shown on the Drawings, all additional excavation so required shall be paid for in accordance with the Special Conditions.

c. Stability and Protection of Excavated Surfaces

The Contractor shall be solely and completely responsible, until completion of the Work, for the safety, stability, maintenance, support and protection of all excavated surfaces, the excavation of which is carried out under the Contract, and for the safety of his work force and the forces of Others while they are in the Contractor's working areas including areas in the immediate vicinity of the excavations. The Contractor shall supply, install and provide all temporary supports, bulkheads, canopies, sheeting and bracing, divert surface water, remove water from the excavations, and shall provide and maintain such drainage and pumping facilities as are necessary to stabilize and protect the excavations. Except as otherwise approved by the Owner or Engineer, such temporary support and facilities shall be removed by the Contractor on completion of the Work.

7.2.5 Foundation Preparation

Foundation preparation of any surface that is to receive fill and from which topsoil, unsuitable material or temporary cover has already been removed shall consist of trimming and levelling to a consistent surface suitable for fill material and proof rolling with a minimum of 4 passes of the specified compaction equipment.

Prior to placing any fill materials on excavated surfaces, the surfaces shall be prepared as follows:

(i) Surfaces of excavations shall be kept clean of any loose debris and compacted with 4 passes of the specified compaction equipment. In the event that the moisture content of these surfaces is too high to permit 4 passes of a vibratory roller and the surface tends to rut and weave, the compaction shall be reduced to 2 passes of the specified compaction equipment, or as required by the Engineer.

(ii) For excavated surfaces, the fill shall be keyed into the native soil by cutting vertical steps into the slope equal in height to the lift thickness of the fill being placed.

Placing of fill materials on excavated surfaces shall not commence until the preparation of the surfaces has been approved in writing by the Engineer.

7.2.6 Fill Placement

a. General

The words "embankment fill", "fill materials", "fill" and "rockfill" shall be regarded as being interchangeable when used in the context of referring to the various zones of material comprising embankments and berms. Similarly the words "backfill" and "bedding" shall be regarded as interchangeable when used in the context of referring to the various zones of materials comprising trench fill.

At least 7 days prior to the scheduled commencement of fill placement the Contractor shall submit to the Owner or Engineer for authorization to proceed with the Work complete details of the various stages, materials, equipment, methods and procedures he proposes to use for such operations and plans for any temporary construction roads. Notwithstanding that the Owner or Engineer has given the Contractor authorization to proceed with such procedures, the Contractor shall be completely responsible for the planning and execution of such procedures.

The Contractor shall be liable for any damage whatsoever to property caused by or resulting from his operations in performing the Work, including dewatering and/or drainage of embankment foundations. Such damage shall be fully repaired by and at the expense of the Contractor.

The Contractor shall prepare the foundations for and shall construct the various zones of fill of embankments and berms and the basin liner to the lines and grades shown on the Drawings and within the tolerances specified herein. Fill materials shall not be placed on any part of foundations until all required excavation, dewatering and foundation preparation and the Contractor has received written approval by the Engineer.

b. Supply and Production of Fill Materials from Borrow Areas

Some of the fill materials for constructing the embankments and berms shall consist of materials excavated from borrow areas. The borrow areas are expected to contain sufficient material to complete the Work. However, the disposition of the material is random and heterogeneous in the borrow areas and shall require proper planning and operation to obtain suitable materials that meet the specified requirements for the various material types. Fill materials that are to be excavated from borrow areas are discussed below.

(i) Zone S material shall be borrowed from Borrow Area 2, 3 and 4, as shown on the Drawings. The Contractor shall be wholly responsible for supplying materials that conform to the specified requirements for each class of material and shall take whatever measures and precautions considered necessary to achieve this objective. Such measures shall include, but not be limited to, planned operation, drainage and selective excavation in the excavations, sorting, blending, screening, etc. The Contractor will be responsible for developing Borrow Area 2, 3 and 4. This includes the construction of access roads and the excavation itself.

(ii) Zone C material shall be borrowed from the rock borrow, as shown on the Drawings. The Contractor will complete all drill and blast activities in the Rock Borrow and will be wholly responsible for supplying materials that conform to the specified requirements.

(iii) Zone T material shall be selectively borrowed from the rock borrow, as shown on the Drawings. The Contractor will complete all drill and blast activities in the Rock Borrow and will be wholly responsible for supplying materials that conform to the specified requirements.

In the event that the Contractor wishes to obtain any materials from sources other than those stipulated above, then it shall carry out, at it's own expense, investigations to show that the materials contained in the alternate sources are suitable for the intended purpose. Such investigations shall be sufficient to establish that the material is suitable. Details of the investigations and the results thereof shall be submitted to the Engineer at least fourteen(14) days before the Contractor intends to commence production in the alternate area. Approval by the Engineer for the Contractor to obtain construction materials from alternative sources shall not relieve the Contractor of its responsibility to produce materials that conform to the specified requirements.

All borrow areas and excavations shall be cleared, grubbed and all topsoil or unsuitable material shall be removed as required by the Engineer prior to commencement of material production in accordance with the provisions of Clause 7.2.2.

Prior to developing any borrow area other than the borrow areas designated on the Drawings or in the Specifications, the Contractor shall carry out such sub-surface investigation and obtain and submit such samples as are required by the Engineer to enable the Engineer to assess the suitability of the materials in the area for the intended use.

The Contractor shall keep accurate exploration records of a type approved by the Engineer of any test pit, trench or drill hole which is excavated for the purpose of investigating construction materials, and a copy of such records shall be submitted to the Engineer within 7 days of the completion of the test pit, trench or drill hole. Samples recovered from test pits, test trenches and drill holes, and submitted to the Engineer for approval, will be tested by the Engineer.

The Contractor's borrow area operations shall be such as to avoid waste of any suitable construction material therein. The Contractor shall clear and grub borrow areas, remove all topsoil or unsuitable material. Borrow areas shall be developed with due consideration for drainage and runoff from the excavated surfaces so as not to cause erosion of the adjacent terrain. Borrow areas shall be excavated in such a manner that water will not collect and stand therein. For materials sensitive to overwetting, the borrow areas shall be developed to minimize the exposure of the material to precipitation. All excavated faces in borrow areas shall be vertical. Before being abandoned, the sides of all borrow areas outside the final limits of the Tailings Storage Facility shall be brought to stable slopes with slope intersections rounded and shaped to provide a natural appearance. All rubbish, Contractor's equipment and structures shall be removed from these areas. Waste piles shall be levelled, trimmed and shaped to regular lines to prevent the occurrence of ponding or of concentrations of surface runoff and to provide a neat appearance. All surface water runoff shall be directed to sediment control facilities approved by the Owner.

Waste material from an excavation for the Work or from a processing operation in a borrow area shall be disposed of in a spoil area or in an area approved by the Owner and set aside for this purpose within the borrow area.

c. Supply and Production of Fill Materials from Stockpiles

Some of the fill materials for constructing the embankments and berms shall consist of materials that will be stored in designated stockpiles that will be developed by the Owner. The stockpiles are expected to contain sufficient material to complete the Work. Fill materials that are to be borrowed from stockpiles are discussed below.

(i) Zone F material will be stored in a stockpile at the Millsite area of the mine. The Zone F stockpile has a maximum capacity of approximately 5,000 cubic metres. No other stockpile areas are available at the Millsite. This shall be taken into consideration when the Contractor evaluates the method of Zone F placement.

The Owner shall be wholly responsible for supplying materials from the stockpiles that conform to the specified requirements for each class of material and shall take whatever measures and precautions considered necessary to achieve this objective. Such measures shall include, but not be limited to, planned operation, drainage and selective excavation in the excavations, sorting, blending, screening, etc. The acceptability of such fill materials shall be determined by the Engineer on the basis of quality control tests that will be made frequently on each material. The Contractor's construction schedule must accommodate the Owner's Zone F production schedules, as per Clause 6.3.

Other sources may be used to supply specialized materials not available from the borrow areas and stockpiles. These sources will be developed by the Owner, after the completion of investigations as described above.

d. Borrow Area Fill Material Requirements

The Contractor shall provide the fill materials required for the Work from the borrow areas and shall ensure that such materials meet the requirements specified herein or shown on the Drawings. The acceptability of such fill materials shall be determined by the Engineer on the basis of quality control tests that will be made frequently on each material.

Borrow area fill materials shall be durable and shall not, except as otherwise specified, contain more than a small proportion of thin, flat or elongated particles and shall be free from organic and other deleterious material. Except as otherwise specified, the particles shall be hard and resistant to breakdown during handling.

Borrow area fill materials shall be well graded within the specified gradation limits. That is, they shall contain a good distribution of all sizes of particles from the coarsest to the finest. The specified gradation limits shall apply to the materials when they are dumped and spread on embankments and berms or placed in trenches prior to any required compaction.

The required gradation envelopes for the various material types from borrow areas used in the Work are specified on the Drawings.

The Contractor shall provide materials to produce fill materials that meet the requirements specified on the Drawings and described in the Technical Specifications. Such provision shall, where necessary, include, but not be limited to, separating material into various sizes, blending one material with another, scalping off oversize material, screening and/or washing to remove fines, crushing or selective excavation of the materials.

All oversize material shall be removed from the fill material either prior to its being placed in embankments and berms or after it is dumped and spread but before compaction operations are started. Material that is a by-product of the processing of materials for one type of material may be incorporated in the fill for another material provided that it satisfies the specifications for such latter material either by itself or after it has been blended with other material.

In the event that the Contractor chooses to stockpile material from the borrow areas, the stockpile locations shall be as approved by the Owner or Engineer. The Contractor shall stockpile fill material, if required, such that excessive segregation shall not occur. Before any area is used for stockpiling, it shall be cleared and stripped as necessary to prevent contamination of the material. Any stripping and grubbing, removal of topsoil or unsuitable material and temporary soil cover that is required shall be carried out by the Contractor in accordance with the provisions of Clauses 7.2.2 and 7.2.3.

e. Stockpile Fill Material Requirements

The Owner shall provide only the Zone F materials required for the Work from the stockpiles and shall ensure that such materials meet the requirements specified herein or shown on the Drawings. The acceptability of such fill materials shall be determined by the Engineer on the basis of quality control tests that will be made frequently on each material.

Stockpile fill materials shall be durable and shall not, except as otherwise specified, contain more than a small proportion of thin, flat or elongated particles and shall be free from organic and other deleterious material. Except as otherwise specified, the particles shall be hard and resistant to breakdown during handling.

Stockpile fill materials shall be well graded within the specified gradation limits. That is, they shall contain a good distribution of all sizes of particles from the coarsest to the finest. The specified gradation limits shall apply to the materials when they are dumped and spread on embankments and berms or placed in trenches prior to any required compaction.

The required gradation envelopes for the various material types from stockpiles used in the Work are specified on the Drawings.

The Owner shall provide materials to produce fill materials that meet the requirements specified on the Drawings and described in the Technical Specifications. Such provision shall, where necessary, include, but not be limited to, separating material into various sizes, blending one material with another, scalping off oversize material, screening and/or washing to remove fines, crushing or selective excavation of the materials.

All oversize material shall be removed from the fill material either prior to its being placed in embankments, trenches or berms or after it is dumped and spread but before compaction operations are started. Material that is a by-product of the processing of materials for one type of material may be incorporated in the fill for another material provided that it satisfies the specifications for such latter material either by itself or after it has been blended with other material.

f. Fill Placement

The Contractor's operations and procedures for placing fill shall be subject to the approval of the Engineer in accordance with the provisions of Clause 7.2.6.a. Furthermore, no fill materials shall be placed in embankments, berms or trenches until all foundation preparation in the fill area has been completed by the Contractor and has been approved in writing by the Engineer.

The Contractor shall construct the embankments and berms only with materials meeting the specified requirements as shown on the Drawing or described in the Technical Specifications. The fill material shall be free from lenses, pockets and layers of materials that are substantially different in gradation from the surrounding material in the same zone.

Fill material shall be excavated, transported, placed and spread in such a manner that segregation is avoided. Any material placed which does not meet the specified requirements shall be removed or remixed, blended, disked, or otherwise reworked by and at the expense of the Contractor to produce a material that does satisfy the specified requirements of the zone, whether or not such material has been covered by other fill material. Except as otherwise specified, the Contractor shall construct each zone by placing, spreading and levelling and, where required, compacting the specified fill material in continuous lifts of the specified thickness. The surface of each lift shall be sloped only at such grades as are necessary to ensure at all times that adequate surface drainage is provided.

Fill shall not be placed against concrete until a minimum of seven(7) days have elapsed after concrete placement.

Except as otherwise specified in the Technical Specifications, fill shall be placed and spread in such a manner that no gaps are left between adjacent placed loads of materials. The fill shall be levelled prior to compaction using a motor grader to obtain a smooth surface free from depressions. Except in areas where space is limited or as is otherwise specified, fill shall be placed by routing the hauling and spreading units approximately parallel to the axis of the embankment and, within practical limits, the hauling units shall be so routed that they do not follow in the same paths but spread their tracks evenly over the surface of the fill. The equipment used for placing fill shall be such that it does not cause segregation of the material.

For trench backfill or working around or near pipes, valves, instrumentation or structures, the Contractor shall exercise particular care in fill placement to avoid damage to the Work. Should the Engineer for any reason wish to re-inspect components previously authorized for backfilling, the Contractor shall excavate and re-expose such Work to the satisfaction of the Engineer. If any fault in the Work is uncovered the Contractor shall make the fault good to the satisfaction of the Engineer and replace the backfill. Such excavation, repairs and backfilling shall be done at the expense of the Contractor.

The Contractor shall have available during all working hours, sufficient heavy rubber tired graders or other equipment, approved by the Engineer in accordance with this Clause to level, re-level and otherwise maintain the uncompacted fill surfaces in a smooth and workmanlike manner.

In fills that require moisture conditioning, the Contractor shall condition the material to the moisture content designated by the Engineer prior to placing the material on the fill zone. The Contractor shall adopt all measures necessary to achieve a moisture content within one percent of that designated, distributed uniformly throughout the layer of material being placed, immediately prior to compaction. The Contractor shall adopt whatever measures necessary to ensure that the designated moisture content is preserved after compaction, until the succeeding layer is placed.

Wherever necessary, after a layer of fill has been placed, the moisture content of the fill material shall be modified to ensure that it is within the range specified. If after placing, spreading and levelling any fill material becomes too wet for proper compaction as determined by the Engineer, it shall be either removed from the embankment or berm or the moisture content reduced to a value acceptable to the Engineer by disking or other approved methods. Suitable disc harrows or other approved equipment shall be available during all working hours for use if required.

Equipment used by the Contractor to apply water to fill material shall be designed to apply water uniformly and at sufficient rates to achieve the designated moisture content. Water tank trucks shall be equipped with positive shut-off valves so that no leakage shall result from the nozzles when the equipment is not operating. In the event that leaks do occur, they shall be repaired immediately.

Moisture conditioning shall be carried out in a manner that will avoid flow of water between zones.

In non-freezing conditions, all zones in the embankments and berms are to be constructed in near horizontal lifts with each lift being completed over the full length and breadth of the zone before material is placed in the next lift. The maximum difference in elevation between adjacent zones in the embankments, permitted at any time during construction, shall be equal to the larger of the two lift thicknesses for the two adjacent zones. Except for this requirement, the Contractor will not be permitted to form any construction joints in the embankments without the approval of the Engineer.

g. Fill Placement During Freezing Conditions

Construction of embankments, berms and basin liner may take place during freezing conditions. The Contractor will be permitted to place fill materials in freezing conditions only if the materials can be placed and compacted to the specified densities that would normally be achieved if freezing conditions did not prevail. Criteria for placing fill materials during freezing conditions are summarized below.

(i) All ice and snow and loose frozen fill materials must be removed from compacted fill surfaces or prepared foundations prior to placing any new fill materials.
(ii) Fill materials can be placed on previously placed and compacted frozen fill or approved frozen foundations provided that the surfaces are cleaned as per (i) above.
(iii) Only non-frozen fill can be placed on embankments and berms. Frozen soils must be removed from the borrow areas prior to excavation of non-frozen fill materials.
(iv) Fill materials must meet the specified moisture content criteria before excavation in the borrow areas and before placement on embankments or berms.
(v) The fill materials must be immediately spread and compacted after placement to achieve the specified density before freezing.
(vi) Fill placement and compaction should occur rapidly and in relatively small areas. The exposed surfaces shall be kept to a minimum so as to minimize the potential for fill materials to become frozen before they are compacted to the specified densities.
(vii) Any fill materials that become frozen prior to compaction to the specified densities must be removed to spoil.
(viii) Fill materials shall not be placed when it is snowing or when there is any accumulation of snow or ice on surfaces to be covered by the succeeding layers of fill.

Methods proposed by the Contractor for construction during freezing conditions shall be reviewed and approved by the Engineer prior to commencing fill placement.

h. Compaction

All fill material, after placing, spreading and levelling to the appropriate layer thickness, shall be compacted in accordance with the requirements of this Sub-clause and to the requirements of the appropriate section in these Technical Specifications.

Compaction of each lift of fill shall proceed in a systematic, orderly and continuous manner such as to ensure that all of each lift receives the compaction specified. The compaction shall be carried out by routing the compaction equipment parallel to the axis of the embankment or berm, except that where such routing is impracticable, such as in roller turning areas, in areas adjacent to the foundations or at the lower elevations of the fill, in areas adjacent to concrete, and in trenches. In such areas the compaction equipment may be routed in any direction provided that all of each lift receives the compaction specified.

Hand guided vibratory compactors shall be used to compact materials which cannot be compacted by the specified vibratory rollers because of locations near pipes, valves, instrumentation, structures, or due to limited accessibility.

The Contractor shall take every precaution when operating compaction equipment to avoid damage to adjacent structures, instrumentation devices and their leads, and to avoid disturbing the foundation. Any such damage or disturbance shall be repaired or remedied by the Contractor at its own expense.

The rolling pattern at all zone boundaries or construction joints shall be such that the full number of roller passes required in one of the adjacent zones or on one side of the construction joint extends completely across the boundary or joint.

Should the surface of the fill become rutted or uneven subsequent to compaction it shall be regraded and recompacted by and at the expense of the Contractor, before the next layer of fill is placed.

All large particles that interfere with compaction shall be removed from the zone in which they were placed, either prior to or during compaction.

The Contractor shall provide sufficient compaction equipment of the types and sizes specified herein as is necessary for compaction of the fill materials. If the Contractor wishes to use alternative equipment, it shall submit to the Engineer for approval complete details of such equipment and the methods proposed for its use. The Engineer's approval of the use of alternative equipment will be dependent upon the Contractor's demonstrating, by constructing suitable test fills to the satisfaction of the Engineer, that such alternative equipment will compact the fill materials to a density not less than that which would be produced by the equipment and number of coverages specified herein.

Compaction equipment shall have sufficient power to handle the most adverse conditions to be encountered during compaction of the fill and required ballasting to the maximum weight specified for compaction of the fill.

When vibratory rollers are operated in a multiple arrangement, all of the rollers shall be similar and similarly ballasted.

Compaction equipment shall be maintained in good condition at all times to ensure that the amount of compaction obtained is a maximum for the equipment. The Contractor shall immediately make adjustments to the equipment to achieve this end whenever such are necessary.

The Contractor shall, prior to shipping compaction equipment to the Site, submit to the Engineer the manufacturer's data providing all dimensions, weights and complete technical data, including descriptions and calculations of applied forces.

Unless approved under the prior provisions of this clause, all fill material shall be compacted using the following specified equipment:

(i) Smooth Drum and Wedge-Foot Drum Vibratory Rollers

Smooth drum and wedge-foot drum vibratory rollers shall be equipped with a suitable cleaning device to prevent the accumulation of material on the drum during rolling. Each roller shall have a total static weight of not less than 10 tonnes at the drum when the roller is standing on level ground. The drum shall be not less than 1.5 metres in diameter and not more than 2.2 metres in width. The vibration frequency of the roller drum during operations shall be between 1100 and 1500 vibrations per minute and the centrifugal force developed by the roller at 1250 vibrations per minute shall not be less than 18 tonnes.

The power of the motor driving the vibrator shall be sufficient to maintain the specified frequency and centrifugal force under the most adverse conditions that may be encountered during compaction of the fill. Propulsion equipment for the roller shall be adequate to propel the roller at speeds up to 6 km/hr.

For compaction by the vibratory roller, 1 coverage shall consist of 1 pass of the roller. A minimum overlap of 300 mm shall be maintained between the surfaces traversed by adjacent passes of the roller drum. During compaction the roller shall be propelled at 3 km/hr.

(ii) Hand-Guided Vibratory Compactors

The Contractor shall adopt special compaction measures consisting of hand guided vibratory compactors to compact fill in trenches, around structures and in other confined areas which are not accessible to the larger vibratory roller. Such compaction shall be capable of compacting the material to the same density as that achieved by the larger vibratory roller.

i. Quality Control

The Engineer will take samples of fill materials and perform gradation and moisture content tests and will carry out field density tests on the compacted fill and any other tests considered necessary to ascertain that the fill being placed or already placed meets the Contract requirements. The results of the tests carried out by the Engineer will be final and conclusive in determining compliance with the Technical Specifications.

Samples for quality control will be excavated by the Engineer. Sample pits by the Engineer shall be backfilled by the Contractor using fill material similar to that excavated and compacted, at no extra charge to the Owner or the Engineer.

The Contractor shall give the Engineer full co-operation in sample taking or testing and shall render such assistance as is necessary to enable such sampling and testing to be carried out expeditiously. Each lift of embankment fill shall be approved by the Engineer prior to placement of further fill. The Contractor shall allow sufficient time for the Engineer to conduct the required test work in order to determine the acceptability of each lift. The making of such tests by the Engineer or the time taken to interpret their results shall not constitute grounds for a claim by the Contractor for additional compensation or an extension of time.

Tests carried out by the Engineer will be performed in accordance with the principles and methods prescribed by the American Society for Testing and Materials (ASTM) and other such recognized authorities with such methods being modified, if necessary, to take into account local conditions and materials containing large particle sizes.

Notwithstanding any quality control testing carried out by the Engineer, the Contractor shall be responsible for performing such tests as are necessary to control the quality of the materials prior to delivery to, and after incorporation in, embankments and berms.

Quality control testing by the Engineer for the purposes defined above will be as follows:

(i) Control Tests on Fill Materials Prior to Compaction

Tests for gradation, and for moisture content, where applicable, will be made on samples of fill materials taken from the borrow areas and stockpiles or from the fill after spreading and prior to compaction, at frequencies sufficient to ensure that the fill materials adopted for use are in full compliance with the Technical Specifications and the Drawings.

The results of these tests will be made available to the Contractor on request as soon as the necessary computations have been completed and checked.

(ii) Record Tests on Fill after Compaction

Tests for gradation, moisture content and density will be made on the fill compacted in place and samples of the fill will be obtained for related laboratory testing, at such frequency as the Engineer considers necessary for the proper evaluation of the properties of the fill materials after compaction.

j. Suspension and Resumption of Operations

In planning and implementing suspension and resumption of fill placement operations, the Contractor shall take into account the requirements for foundation preparation.

The Contractor shall not place fill materials at such times that conditions for such operations are unsatisfactory due to excess rain, extreme low temperatures or any other reason. The Contractor will be permitted to place fill during freezing conditions only if it can be placed and compacted to densities equal to those that would be achieved in the same material if freezing conditions did not prevail. Fill materials may be placed during freezing weather and on frozen fill surfaces provided that the materials in such surfaces were compacted as required by the Engineer before they became frozen and that the surface is free of snow and ice. The requirements for construction during freezing conditions are discussed in detail in Clause 7.2.6.g.

If placement of fill is suspended because of precipitation or impending precipitation or for any other reason, the surface shall be graded and rolled smooth to seal the surface to avoid unnecessary absorption of moisture. In order to achieve this, the Contractor may at his option, provide cross or crown slopes of up to 5 percent for drainage control. The runoff from fills in progress shall be directed to sediment control facilities to the satisfaction of the Engineer.

Where operations have been suspended, the effects of rain or other adverse conditions will be assessed by the Engineer before approval is given to resume placing. Equipment shall not be allowed to travel on the fill until the fill has dried sufficiently to prevent excessive rutting and to allow the equipment to be operated satisfactorily.

k. Protection and Maintenance

The Contractor shall maintain any placed fill in a neat and workmanlike condition until completion of the Work. The Contractor shall take such steps as are necessary to avoid ponding of water on the fill or contamination of the fill by traffic or other causes, and it shall at all times keep the surface and slopes of the embankment free from rubbish, rejected or unsuitable fill, or waste materials.

The Contractor shall do whatever is necessary to prevent surface runoff or water from any other source from eroding fill materials placed for the Work, and shall, at its own expense, immediately repair any damage resulting from such erosion. Any repairs shall be carried out using the same standards for quality and workmanship as defined in the Contract Documents for the portion of the Work being repaired.

Should any slide, including all movements of earth, rock, debris, or other material occur within or onto any part of the embankments or berms, the Contractor shall remove such materials and all other materials affected as directed by the Owner, and any portions of the embankments or berms so removed shall be rebuilt in accordance with the Contract Documents.

Unless shown otherwise on the Drawings, buried pipework shall not be crossed by motorized vehicles until the specified backfill has been compacted to a depth of at least 300 mm above the crown of the pipe. In embankments or roadways subject to compacting equipment or high wheel loads the depth of cover shall be at least 600 mm above the crown of the pipe. Temporary crossings shall be adequately flagged.

7.2.7 Construction Tolerances

The Contractor shall construct the various embankment fill zones to the lines and grades as shown on the Drawings, within the tolerances specified below:

Description	Maximum Permissible Deviation	
	Line	Grade[Note 1]
Excavation slopes	± 300 mm	± 150 mm
Fill slopes	± 300 mm	± 150 mm
Embankment crest	± 300 mm	+ 150 mm - 0mm
Construction access roads	± 300 mm	+ 150 mm - 0 mm

1. No work will be accepted if the grade is other than specified.

The location of the embankment foundation will depend on the conditions encountered and shall be determined by the Engineer. Any deviation from the foundation elevations shown on the Drawings shall be subject to the provisions of Clause 7.2.3 and Clause 7.2.4.

7.2.8 As-Built Survey

An as-built survey is required to accompany all interim and final monthly progress estimates to show the progress of the Work. The as-built survey shall be presented on as-built drawings which shall be made available to the Owner on computer diskette in AutoCAD.dwg file format, complete with X, Y, and Z co-ordinates (northing, easting and elevation). The as-built drawing shall contain at a minimum:

- Fill levels at 25 metre chainage points shown on the Drawings (toes and crests).
- Fill zone boundaries at 25 metre chainage points shown on the Drawings.

- Final excavated surfaces, including shoulders and toes.
- Final clearing and stripping and grubbing limits.
- Top of pipe surveys for all installed pipes.
- All buried services, instrumentation, etc.
- Investigation locations.
- Haul road locations.

No separate measurement or payment will be made for the as-built survey which shall be included in the respective applicable unit rates entered in Part 3, Tender Schedule B.

7.2.9 Measurement and Payment

Payment for earthworks items in the Stage 3C work areas shall include provision by the Contractor of survey and adequate supervision of the work and maintenance of haul roads.

Measurement for payment for clearing, stripping and grubbing from the South Embankment will be made of the horizontal projection of the net area in square metres on which these operations have been performed. No measurement or payment will be made of areas outside those shown on the Drawings or for those areas that have already been cleared and stripped and grubbed.

Measurement for payment for foundation preparation will be made of the horizontal projection of the net area in square metres of the footprint of the Stage 3C work areas on the ground surface after topsoil removal to the limits shown on the Drawings or as otherwise instructed. No measurement or payment will be made of foundation preparation outside such lines.

Payment for embankment foundation preparation will be made under Items 2.a, 3.a and 4.a of Tender Schedule B.

Measurement for payment for supplying, placing, spreading and levelling of fill material from borrow areas to form the required layer thicknesses, moisture conditioning and compaction in the embankments and basin liner will be made of the net volume in cubic metres of compacted fill in each zone measured from the lower prepared surface to the dimensions, lines and grades as shown on the Drawings. Measurement and payment will not be made for material placed beyond the dimensions, lines and grades as shown on the Drawings without written authorization from the Owner. Payment for fill material so measured shall include for supplying (loading), hauling, dumping, spreading, levelling, moisture conditioning if required, and compaction.

Payment for supplying (loading), hauling, dumping, spreading, levelling, moisture conditioning if required, and compacting Zone S material in the Main Embankment will be made under Item 2.d of Tender Schedule B.

Payment for supplying (loading), hauling, dumping, spreading, levelling, moisture conditioning if required, and compacting Zone S material in the Perimeter Embankment will be made under Item 3.d of Tender Schedule B.

Payment for supplying (loading), hauling, dumping, spreading, levelling, moisture conditioning if required, and compacting Zone S material in the South Embankment will be made under Item 4.b of the accepted Tender Schedule B.

Payment for supplying (loading), hauling, dumping, spreading, levelling, moisture conditioning if required, and compacting Zone T material in the Main Embankment will be made under Item 2.e of Tender Schedule B.

Payment for supplying (loading), hauling, dumping, spreading, levelling, moisture conditioning if required, and compacting Zone T material in the Perimeter Embankment will be made under Item 3.e of Tender Schedule B.

Payment for supplying (loading), hauling, dumping, spreading, levelling, moisture conditioning if required, and compacting Zone T material in the South Embankment will be made under Item 4.c of Tender Schedule B.

Payment for supplying (loading), hauling, dumping, spreading, levelling, moisture conditioning if required, and compacting Zone C material in the Main Embankment will be made under Item 2.b of Tender Schedule B.

Payment for supplying (loading), hauling, dumping, spreading, levelling, moisture conditioning if required, and compacting Zone C material in the Perimeter Embankment will be made under Item 3.b of Tender Schedule B.

Measurement for payment for placing, spreading and levelling of Zone F fill material from stockpiles to form the required layer thicknesses, moisture conditioning and compaction in the embankments will be made of the net volume in cubic metres of compacted fill in each zone measured to the dimensions, lines and grades as shown on the Drawings. Measurement and payment will not be made for material placed beyond the dimensions, lines and grades as shown on the Drawings without written authorization from the Owner. Payment for fill material so measured shall include for hauling, dumping, spreading, levelling, moisture conditioning if required, and compaction.

Payment for loading, hauling, dumping, spreading, levelling, moisture conditioning if required, and compacting Zone F material in the Main Embankment will be made under Item 2.c of Tender Schedule B.

Payment for loading, hauling, dumping, spreading, levelling, moisture conditioning if required, and compacting Zone F material in the Perimeter Embankment will be made under Item 3.c of Tender Schedule B.

No separate measurement or payment will be made for the following which shall be included in the respective applicable unit rates entered in Part 3, Tender Schedule B:

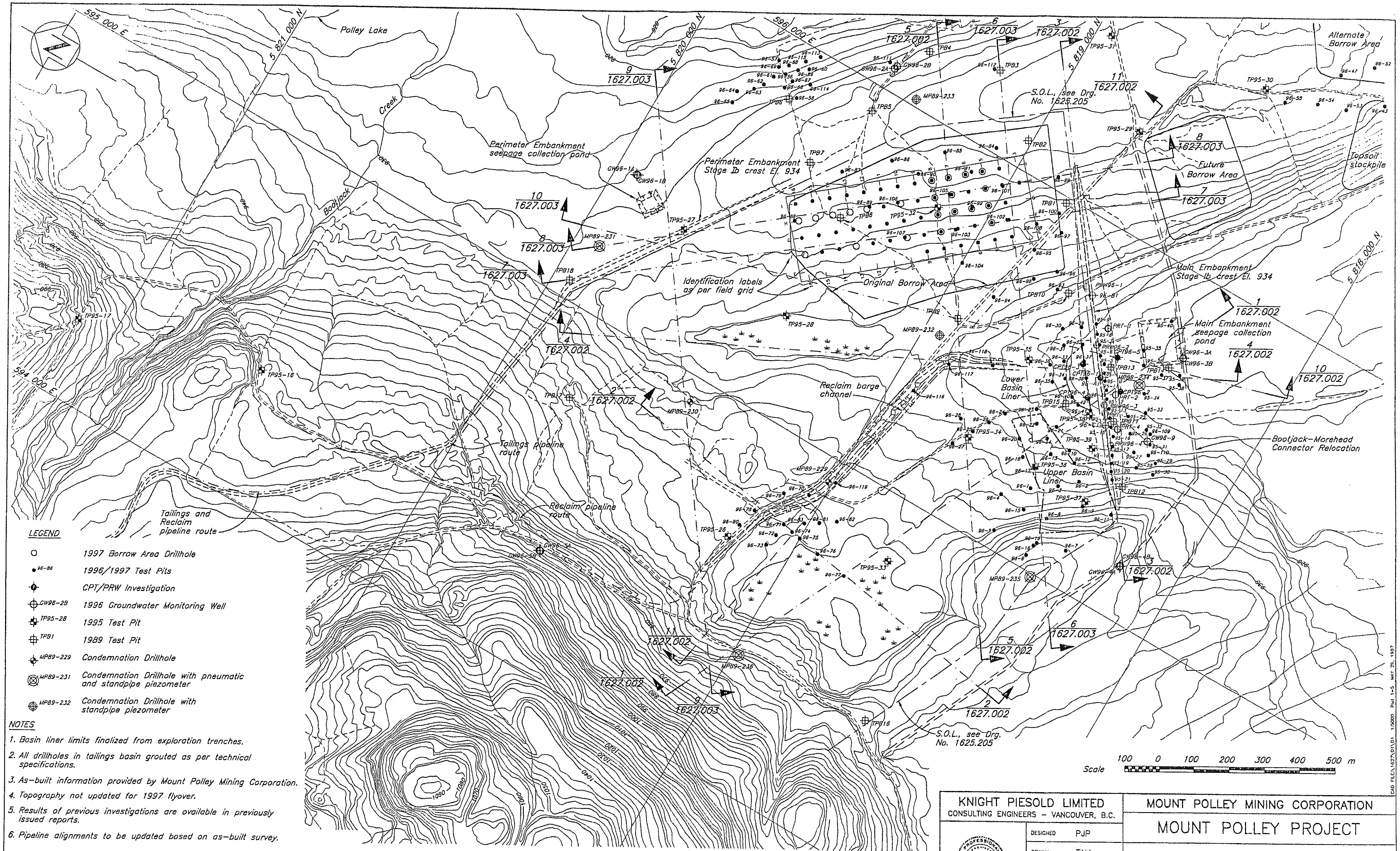
- Water Diversion, dewatering of foundation excavation, etc. or any other measure the Contractor deemed necessary to complete the work as per the Contract Documents.
- Clearing, stripping and grubbing and removal of topsoil and/or unsuitable material in borrow areas.
- Temporary haul roads.

Knight Piésold
CONSULTING

APPENDIX G

PREVIOUS GEOLOGICAL INVESTIGATIONS

Drawing 1627.001 Rev 0	Location Plan
Drawing 1627.002 Rev 0	Section 1
Drawing 1627.003 Rev 0	Section 2
Drawing 1627.004 Rev 0	Section 3
Drawing 1627.005 Rev 0	Section 4
Drawing 1627.006 Rev 0	Section 5
Drawing 1627.007 Rev 0	Section 6
Drawing 1627.008 Rev 0	Section 7
Drawing 1627.009 Rev 0	Section 8
Drawing 1627.010 Rev 0	Section 9
Drawing 1627.011 Rev 0	Section 10
Drawing 1627.012 Rev 0	Section 11



LEGEND

○	1997 Borrow Area Drillhole
96-86	1996/1997 Test Pits
	CPT/PRW Investigation
GW96-2B	1996 Groundwater Monitoring Well
TP95-28	1995 Test Pit
TPB1	1989 Test Pit
MP89-229	Condemnation Drillhole
MP89-231	Condemnation Drillhole with pneumatic and standpipe piezometer
MP89-232	Condemnation Drillhole with standpipe piezometer

NOTES

1. Basin liner limits finalized from exploration trenches.
2. All drillholes in tailings basin grouted as per technical specifications.
3. As-built information provided by Mount Polley Mining Corporation.
4. Topography not updated for 1997 flyover.
5. Results of previous investigations are available in previously issued reports.
6. Pipeline alignments to be updated based on as-built survey.

DRG. NO.	DESCRIPTION
REFERENCE DRAWINGS	

REV.	DATE	DESCRIPTION	APPROVED
REVISIONS			

REV.	DATE	DESCRIPTION	APPROVED
0	MAY 30/97	ISSUED FOR UPDATED DESIGN REPORT	KJB
REVISIONS			

KNIGHT PIESOLD LIMITED
CONSULTING ENGINEERS - VANCOUVER, B.C.

PROFESSIONAL ENGINEER K. D. K. EMBREE

DESIGNED	PJP
DRAWN	TAM
CHECKED	KDE
APPROVED	KJB

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY PROJECT

TAILINGS STORAGE FACILITY
GEOLOGICAL INVESTIGATIONS
LOCATION PLAN

DATE	SCALE	DRG. NO.	REV.
MAY 16, 1997	AS SHOWN	1627.001	0

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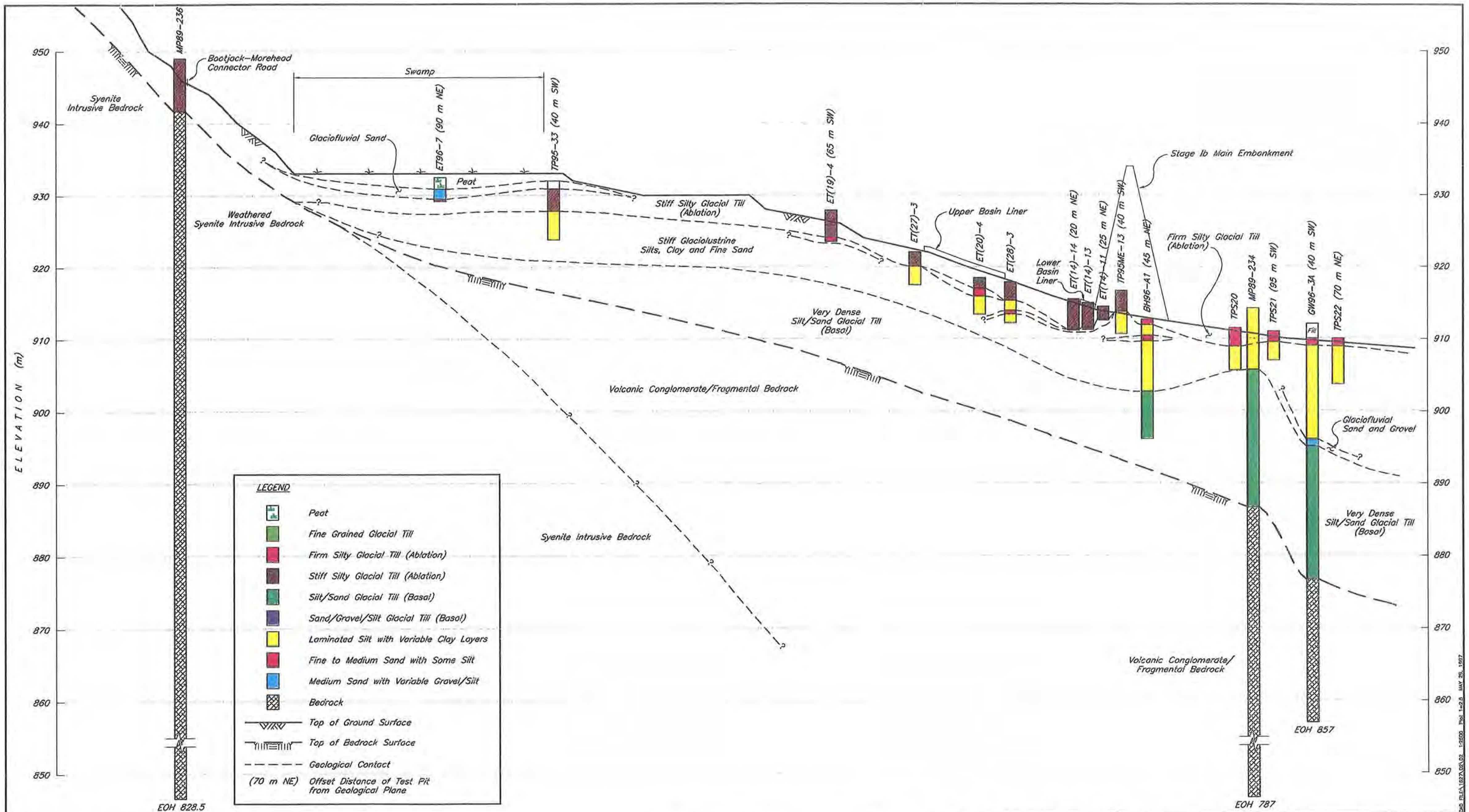

Vert. Scale 10 5 0 10 20 Metres

Horiz. Scale 100 50 0 100 200 Metres

DRG. NO.	DESCRIPTION
REFERENCE DRAWINGS	

REV.	DATE	DESCRIPTION	APPROVED
REVISIONS			

REV.	DATE	DESCRIPTION	APPROVED
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KNIGHT PIESOLD LIMITED
CONSULTING ENGINEERS – VANCOUVER, B.C.

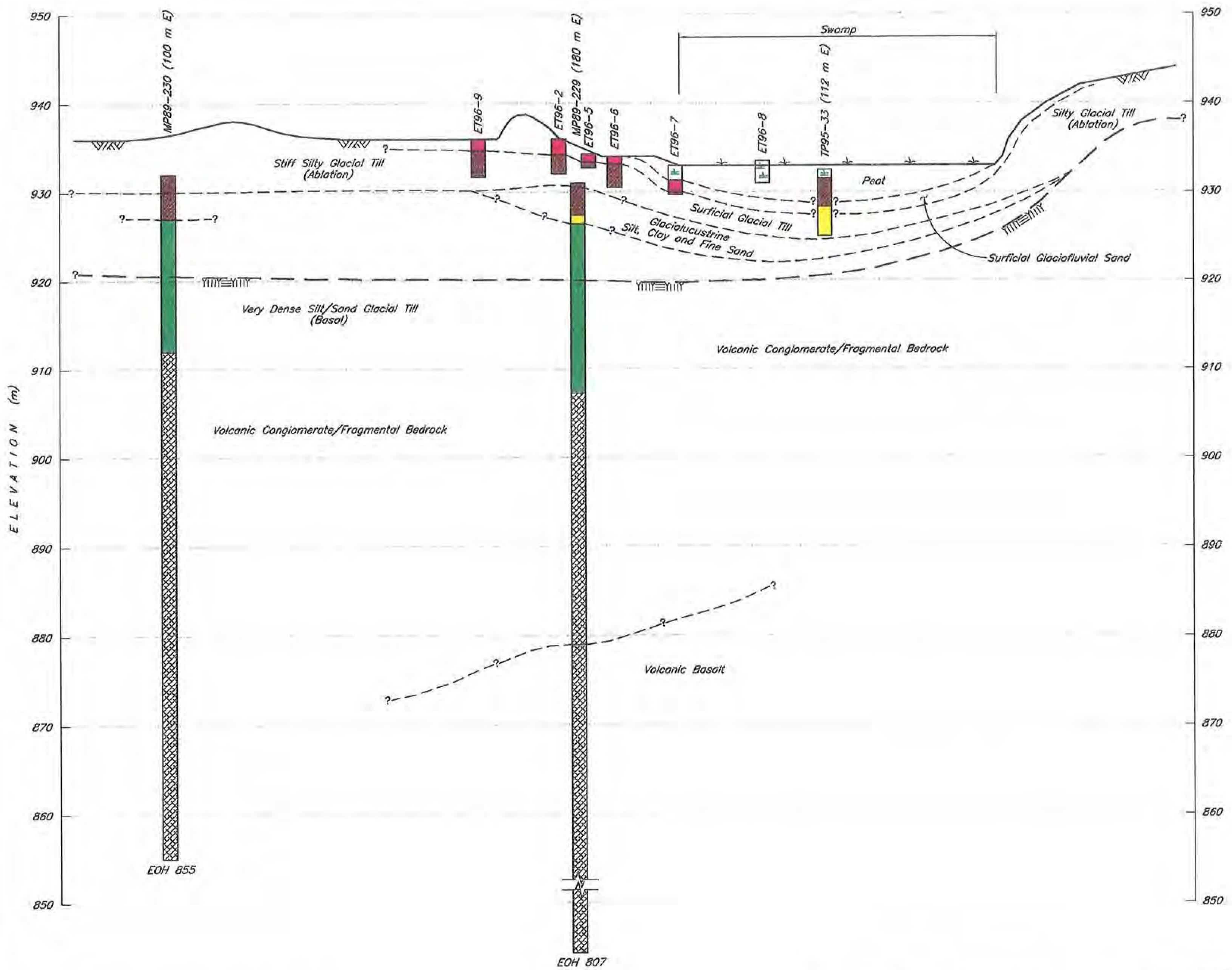
DESIGNED PJP
DRAWN NAR
CHECKED KOE
APPROVED KJB

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY PROJECT

TAILINGS STORAGE FACILITY
GEOLOGICAL INVESTIGATIONS
SECTION 1

DATE MAY 16, 1997 | SCALE AS SHOWN | DRG. NO. 1627.002 | REV. 0



LEGEND

- Peat
- Fine Grained Glacial Till
- Firm Silty Glacial Till (Ablation)
- Stiff Silty Glacial Till (Ablation)
- Silt/Sand Glacial Till (Basal)
- Sand/Gravel/Silt Glacial Till (Basal)
- Laminated Silt with Variable Clay Layers
- Fine to Medium Sand with Some Silt
- Medium Sand with Variable Gravel/Silt
- Bedrock
- Top of Ground Surface
- Top of Bedrock Surface
- Geological Contact
- (70 m NE) Offset Distance of Test Pit from Geological Plane

Vert. Scale 10 5 0 10 20 Metres

Horiz. Scale 100 50 0 100 200 Metres

DRG. NO.	DESCRIPTION
REFERENCE DRAWINGS	

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REVISIONS			

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CONSULTING ENGINEERS – VANCOUVER, B.C.

PROFESSIONAL ENGINEER, PROVINCE OF BRITISH COLUMBIA, K. J. BROUWER

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DRAWN	NAR
CHECKED	KDE
APPROVED	KJB

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY PROJECT

TAILINGS STORAGE FACILITY
GEOLOGICAL INVESTIGATIONS
SECTION 2

DATE MAY 16, 1997 | SCALE AS SHOWN | DRG. NO. 1627.003 | REV. 0

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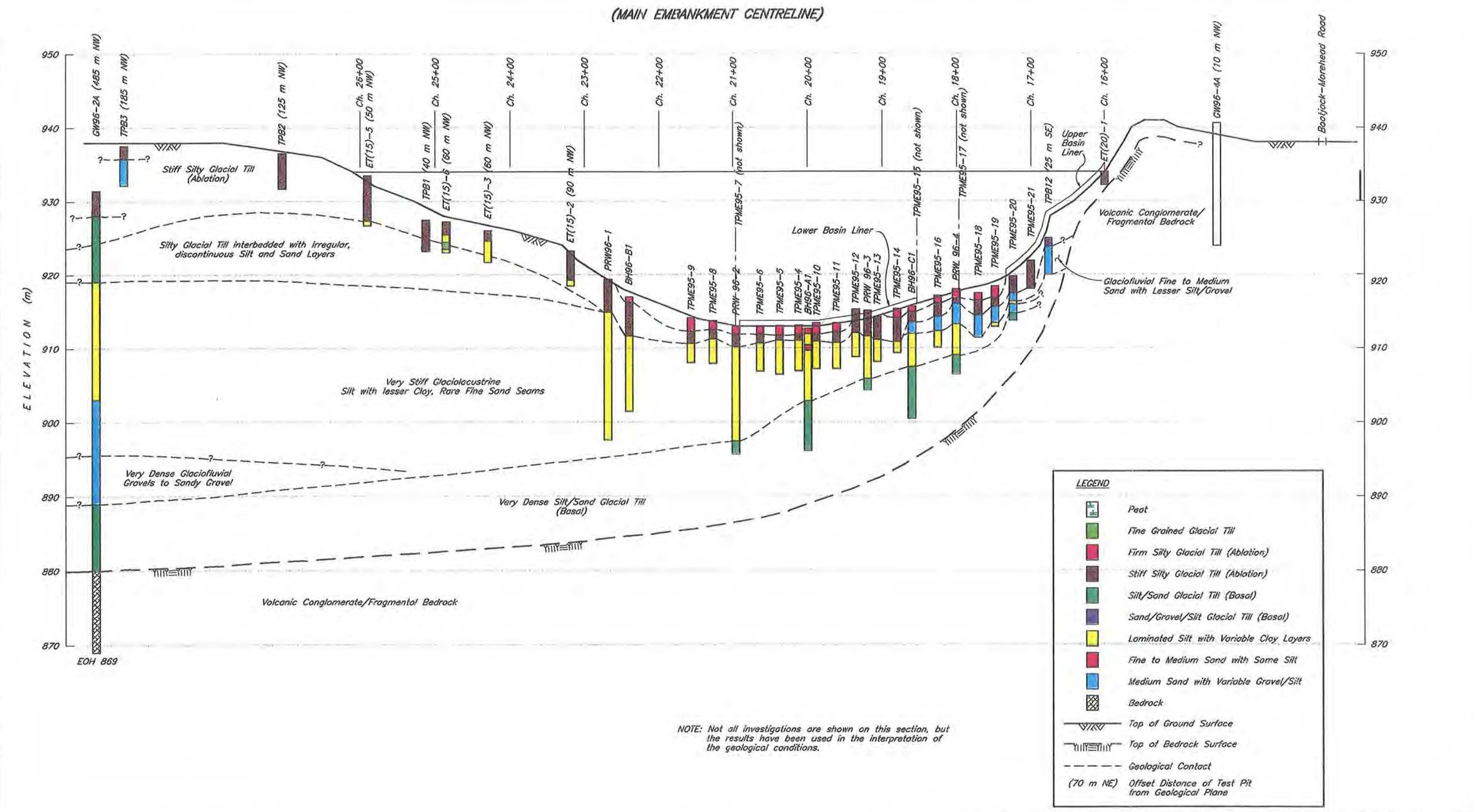

Vert. Scale 10 5 0 10 20 Metres

Horiz. Scale 100 50 0 100 200 Metres

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TAILINGS STORAGE FACILITY
GEOLOGICAL INVESTIGATIONS
SECTION 3

DATE MAY 16, 1997 | SCALE AS SHOWN | DRG. NO. 1627.004 | REV. 0

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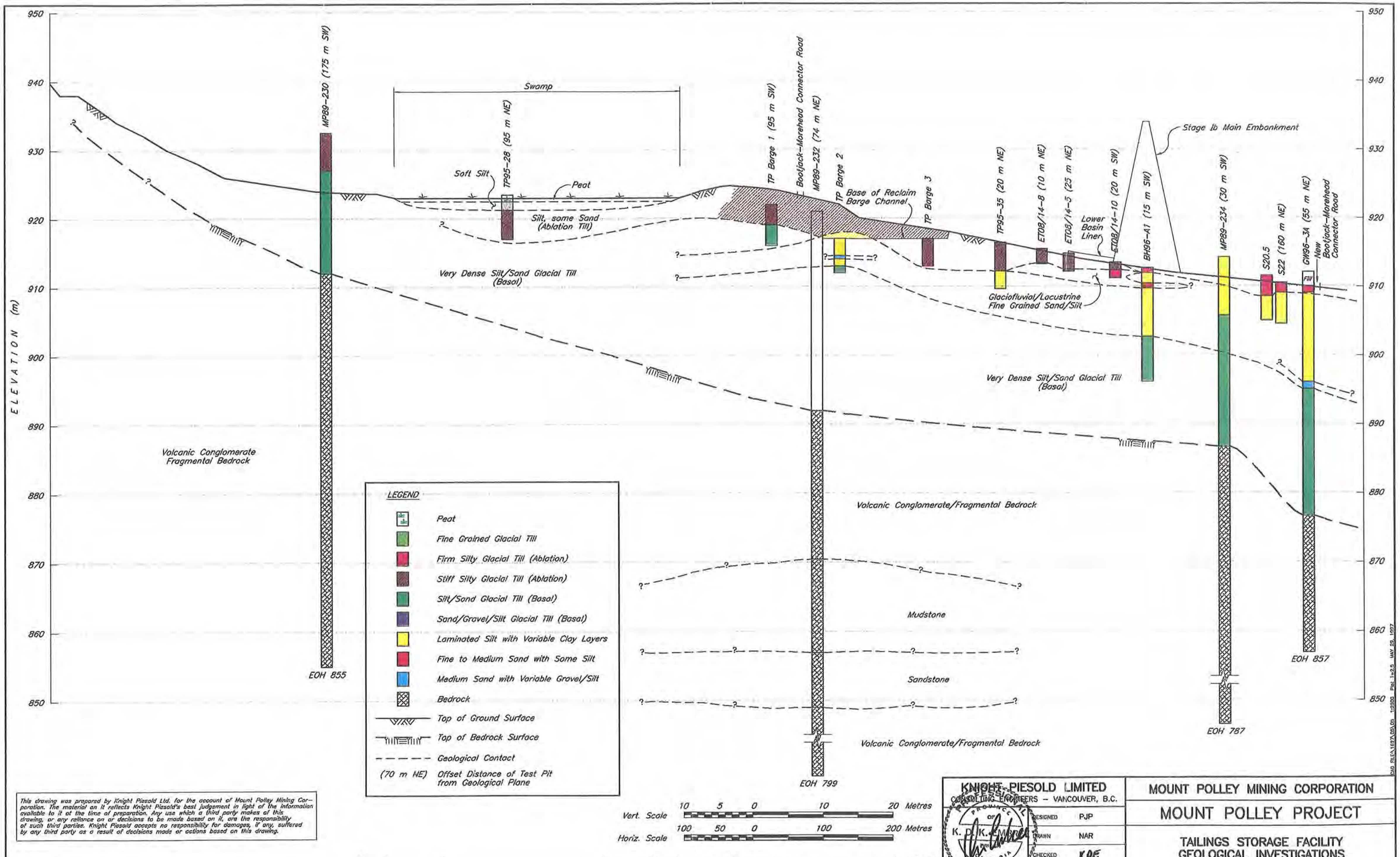

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GEOLOGICAL INVESTIGATIONS
SECTION 4

DATE MAY 16, 1997 | SCALE AS SHOWN | DRG. NO. 1627.005 | REV. 0

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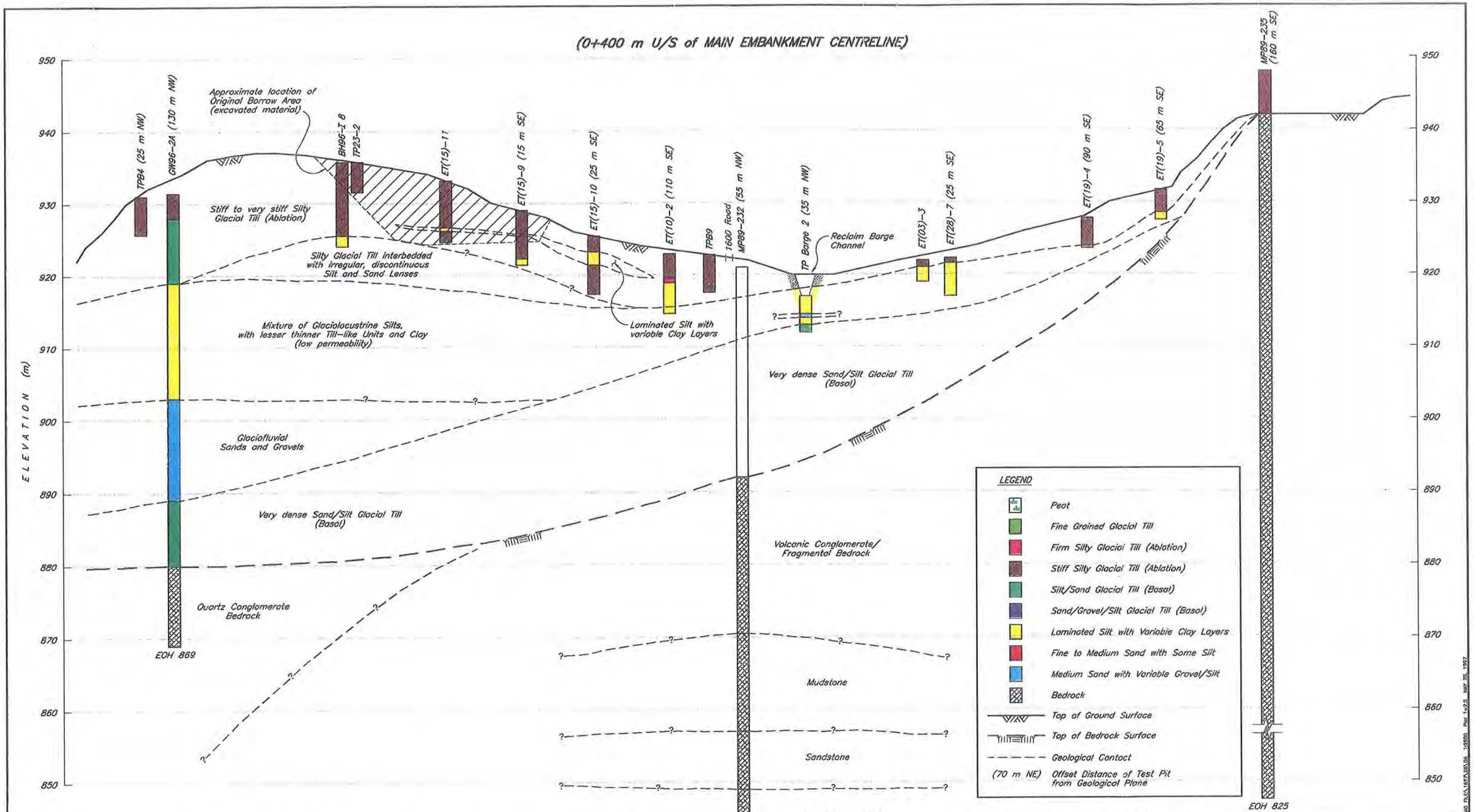

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Vert. Scale 10 5 0 10 20 Metres

Horiz. Scale 100 50 0 100 200 Metres

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SECTION 5

DATE MAY 16, 1997 | SCALE AS SHOWN | DRG. NO. 1627.006 | REV. 0

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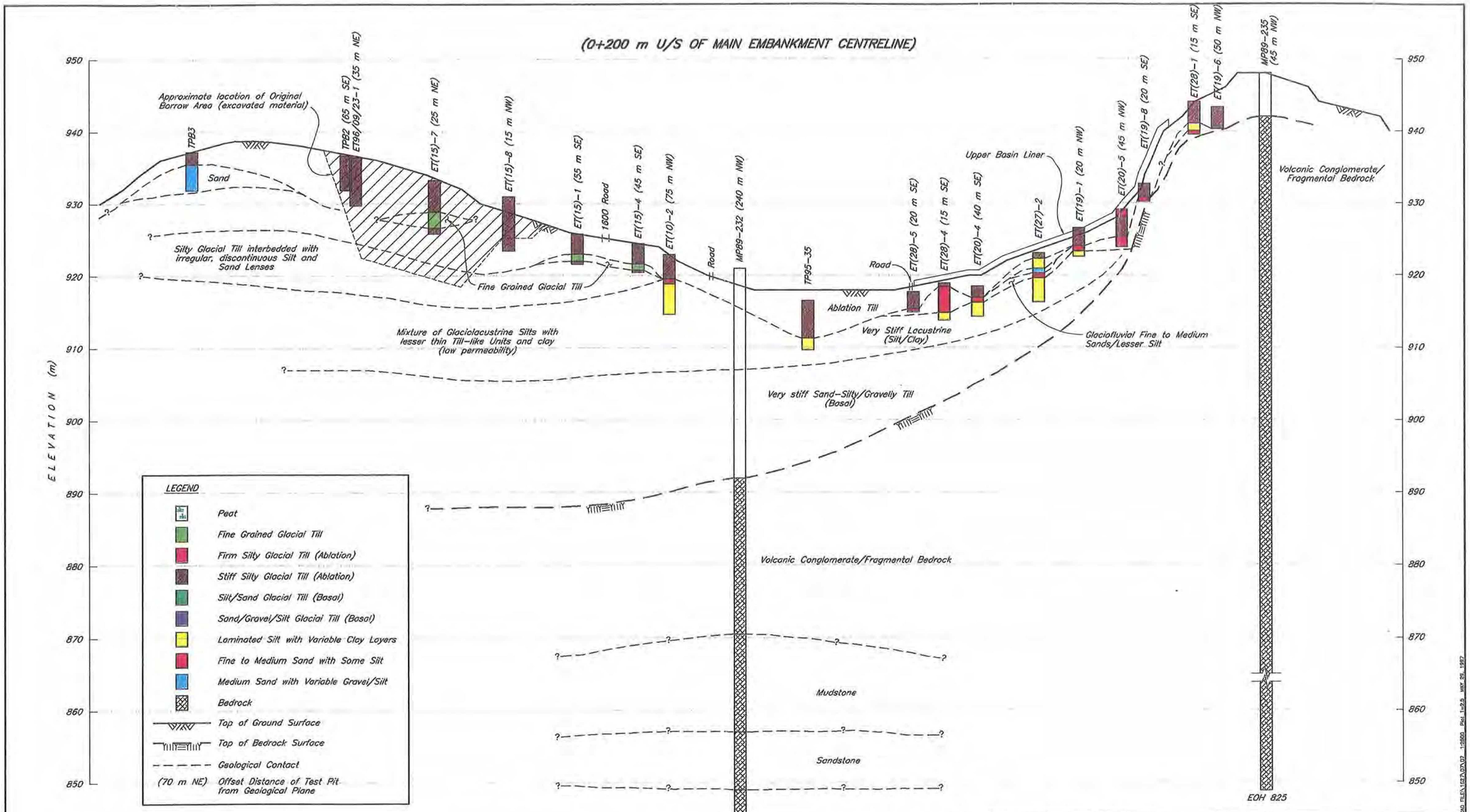
(0+200 m U/S OF MAIN EMBANKMENT CENTRELINE)



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Vert. Scale 10 5 0 10 20 Metres

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PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — K. D. K. EMBREE

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DRAWN NAR
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GEOLOGICAL INVESTIGATIONS
SECTION 6

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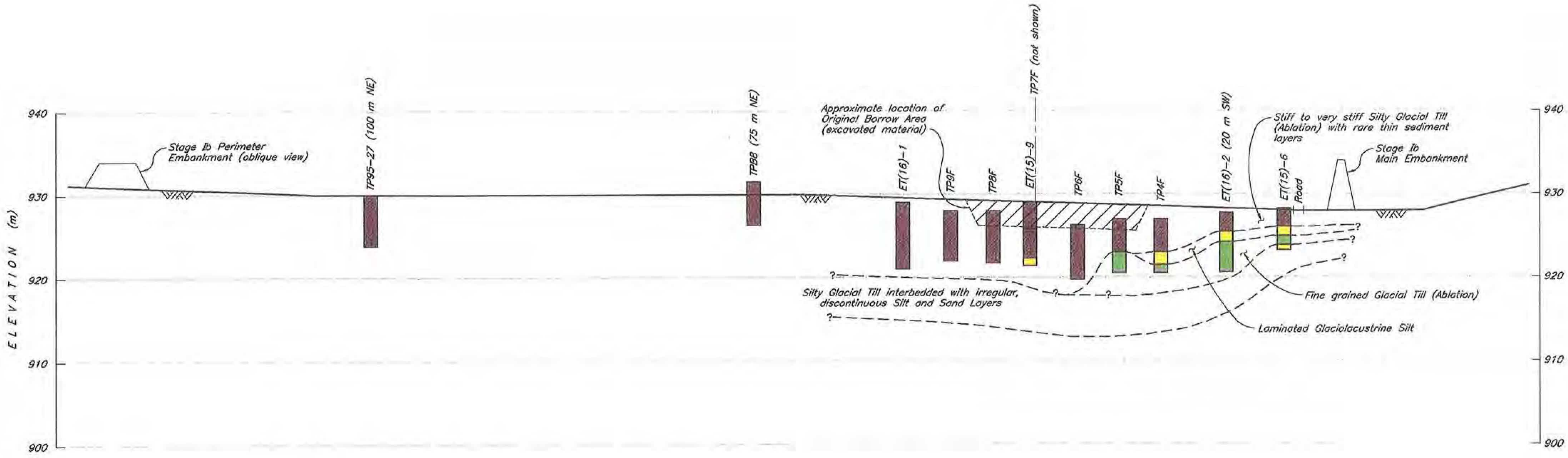

LEGEND

- Peat
- Fine Grained Glacial Till
- Firm Silty Glacial Till (Ablation)
- Stiff Silty Glacial Till (Ablation)
- Silt/Sand Glacial Till (Basal)
- Sand/Gravel/Silt Glacial Till (Basal)
- Laminated Silt with Variable Clay Layers
- Fine to Medium Sand with Some Silt
- Medium Sand with Variable Gravel/Silt
- Bedrock
- Top of Ground Surface
- Top of Bedrock Surface
- Geological Contact
- (70 m NE) Offset Distance of Test Pit from Geological Plane

Vert. Scale 10 5 0 10 20 Metres

Horiz. Scale 100 50 0 100 200 Metres

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PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — K. D. J. EMBREE

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APPROVED	KJB

MOUNT POLLEY MINING CORPORATION

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GEOLOGICAL INVESTIGATIONS
SECTION 7

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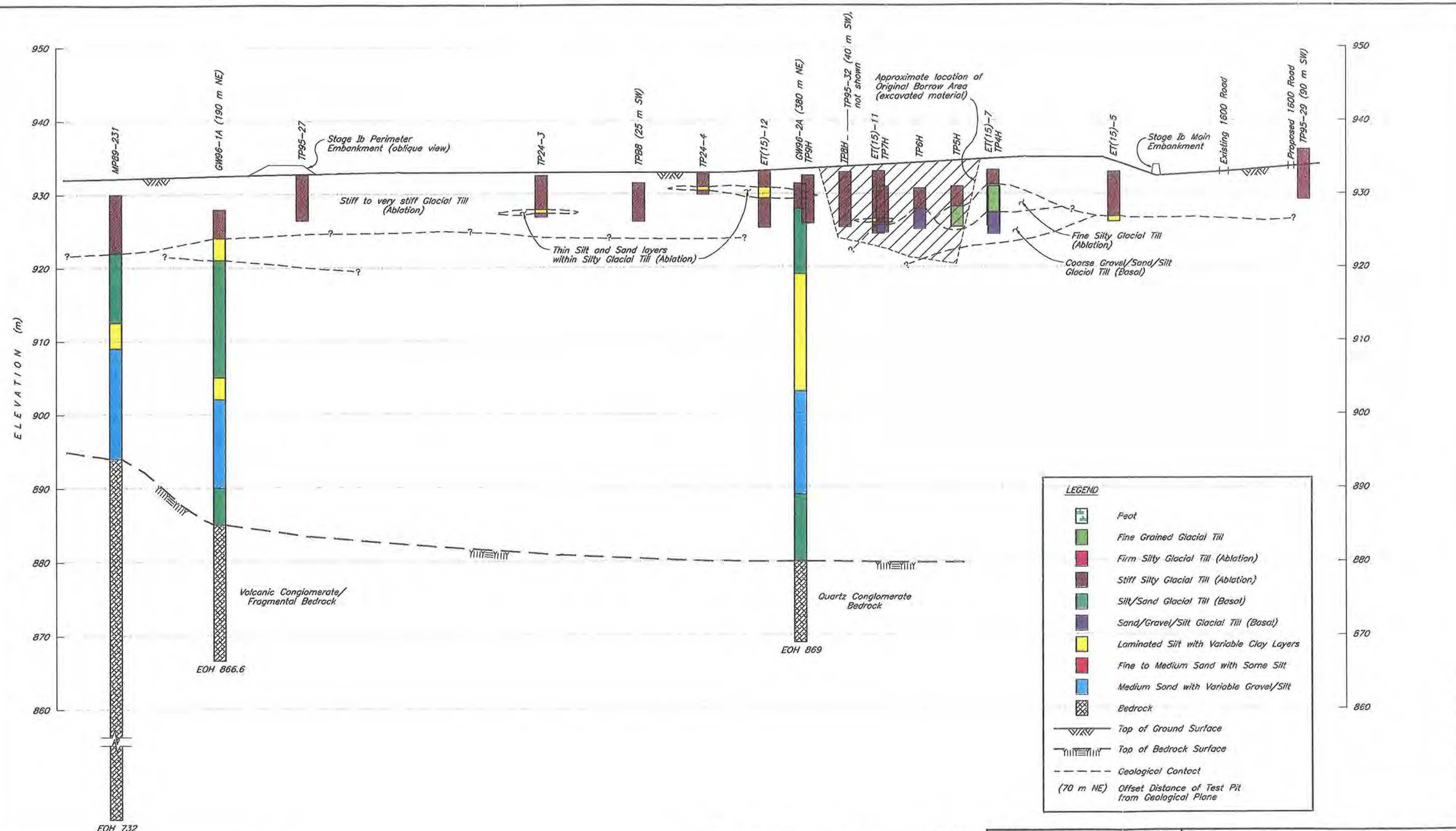

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CONSULTING ENGINEERS – VANCOUVER, B.C.

PROFESSIONAL ENGINEER – K. D. BREE – PROVINCE OF BRITISH COLUMBIA

DESIGNED	PJP
DRAWN	NAR
CHECKED	KDE
APPROVED	KJB

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY PROJECT

TAILINGS STORAGE FACILITY
GEOLOGICAL INVESTIGATIONS
SECTION 8

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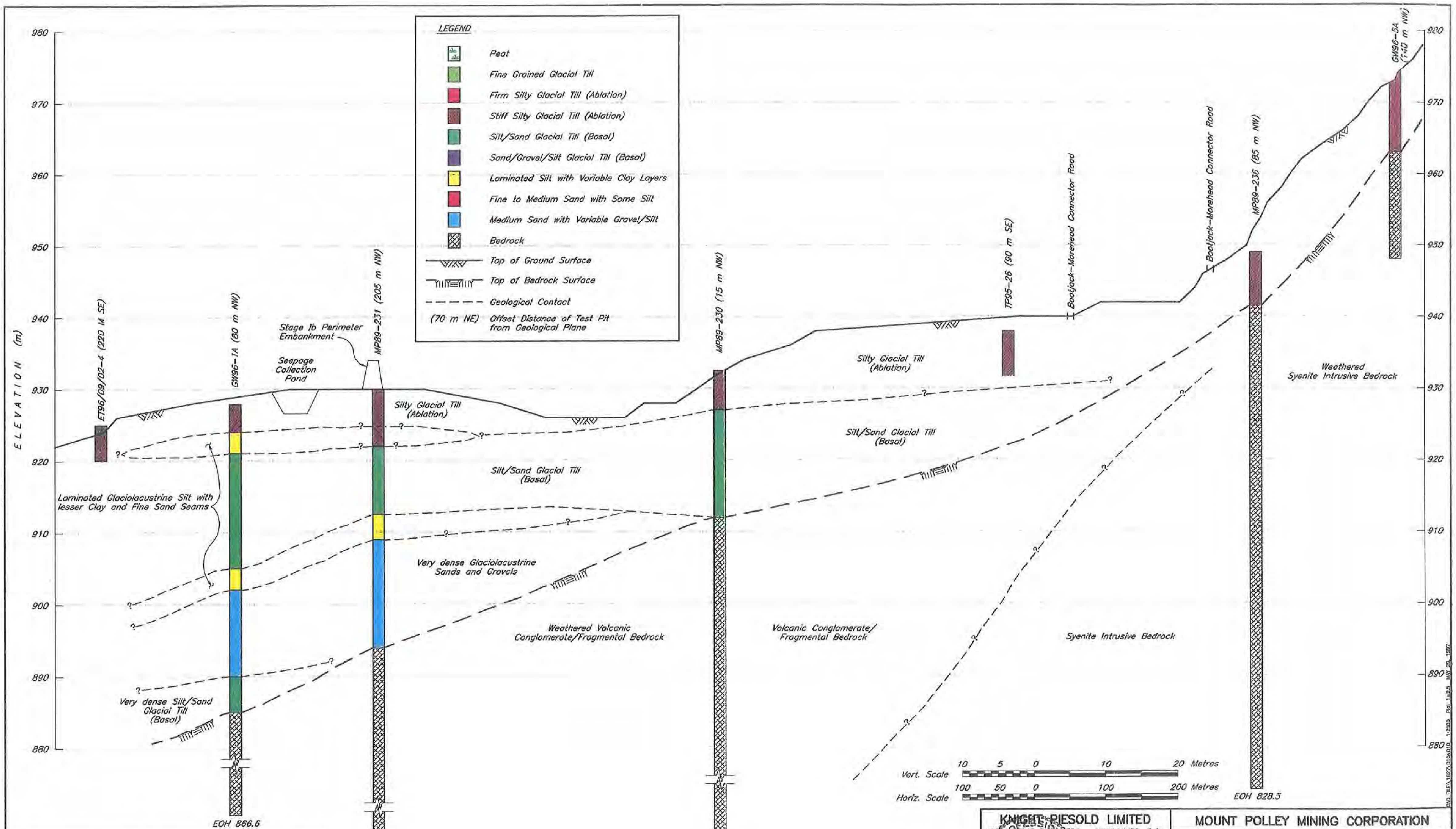

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REVISIONS

KNIGHT PIESOLD LIMITED
CONSULTING ENGINEERS - VANCOUVER, B.C.

PROVINCE OF BRITISH COLUMBIA — K. D. ENGINEER — PROFESSIONAL ENGINEER

DESIGNED	PJP
DRAWN	NAR
CHECKED	KDE
APPROVED	KJB

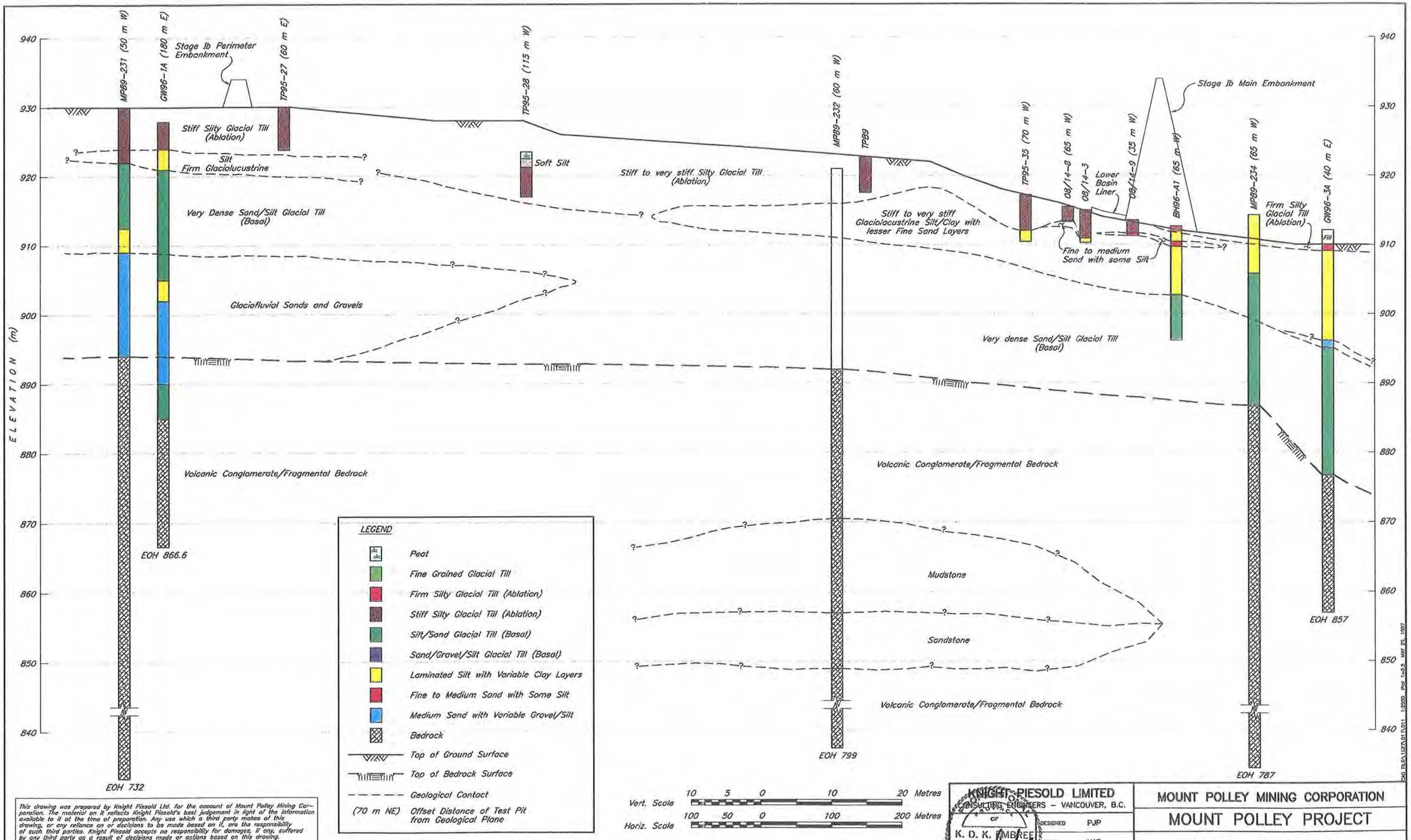
MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY PROJECT

TAILINGS STORAGE FACILITY GEOLOGICAL INVESTIGATIONS SECTION 9

DATE MAY 16, 1997 | SCALE AS SHOWN | DRG. NO. 1627.010 | REV. 0

CAD FILE\1627.010.010



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REVISIONS			

REV.	DATE	DESCRIPTION	APPROVED
0	MAY 29/97	ISSUED FOR UPDATED DESIGN REPORT	KJB
REVISIONS			

KNIGHT PIESOLD LIMITED
CONSULTING ENGINEERS – VANCOUVER, B.C.

K. D. K. EMBREE — ENGINEER

DESIGNED	PJP
DRAWN	NAR
CHECKED	KDE
APPROVED	KJB

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY PROJECT

TAILINGS STORAGE FACILITY
GEOLOGICAL INVESTIGATIONS
SECTION 10

DATE	SCALE	DRG. NO.	REV.
MAY 16, 1997	AS SHOWN	1627.011	0

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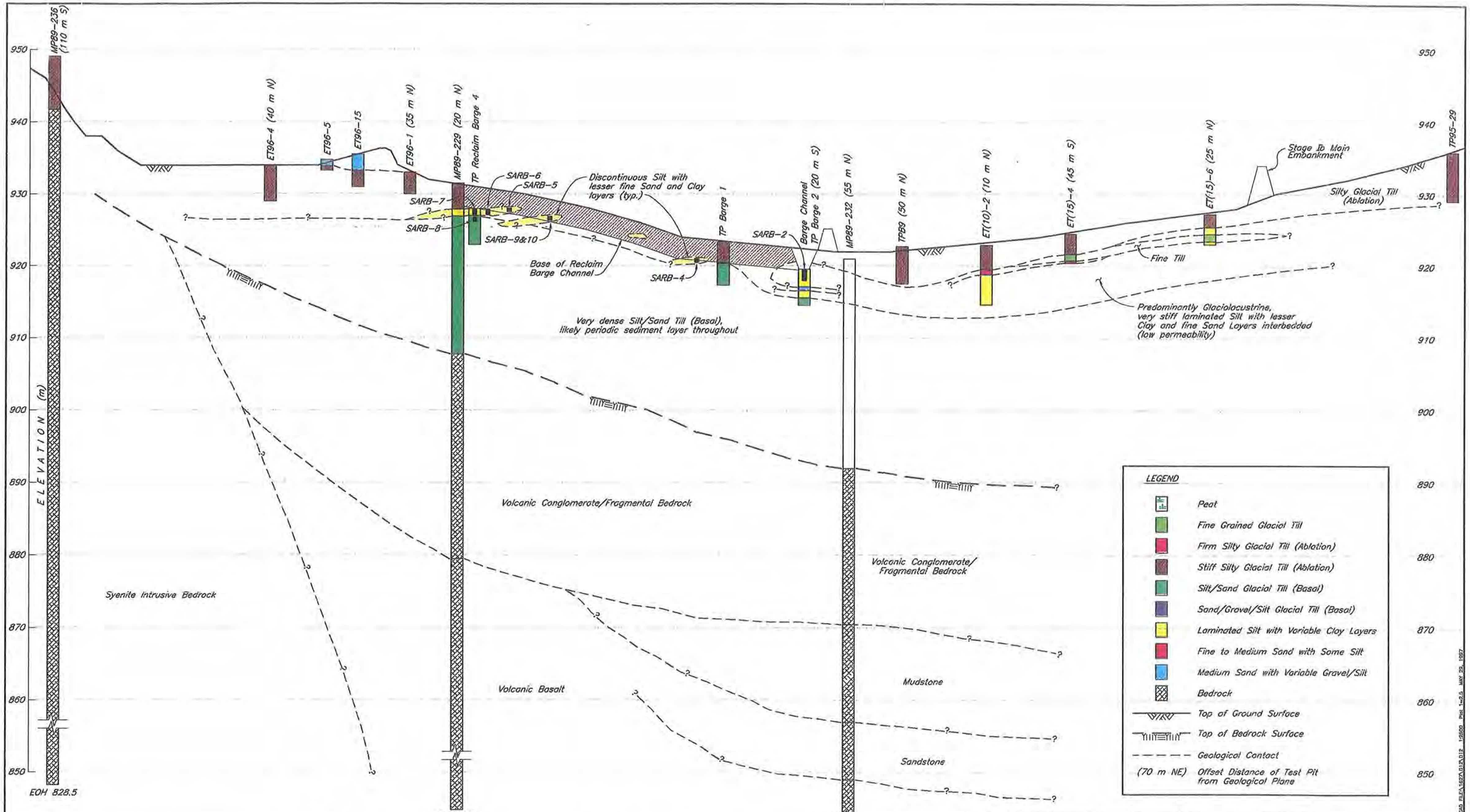

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Vert. Scale 10 5 0 10 20 Metres

Horiz. Scale 100 50 0 100 200 Metres

DRG. NO.	DESCRIPTION
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REV.	DATE	DESCRIPTION	APPROVED
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KNIGHT PIESOLD LIMITED
CONSULTING ENGINEERS – VANCOUVER, B.C.

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — K. D. EMBREE

DESIGNED	PJP
DRAWN	NAR
CHECKED	KDE
APPROVED	KJB

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY PROJECT

TAILINGS STORAGE FACILITY GEOLOGICAL INVESTIGATIONS SECTION 11

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