MPMC00018

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

REPORT ON
2000 AND 2001 ANNUAL INSPECTION
(REF. NO. 11162/14-2)

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TABLE OF CONTENTS

PAGE

TABLES

FIGURES

DRAWINGS

APPENDICES

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MOUNT POLLEY MINE
TAILINGS STORAGE FACILITY

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SECTION 1.0 - INTRODUCTION

1.1 PROJECT DESCRIPTION

The Mount Polley gold and copper mine is owned and operated by Mount Polley Mining Corporation (MPMC). It is located in central British Columbia, 56 kilometres northeast of Williams Lake. The Mount Polley mine has been in production since June 13, 1997. Ore is crushed and processed by selective flotation to produce a copper-gold concentrate. The current mill throughput rate is approximately 20,000 tonnes per day (7.3 million tonnes per year). An overall site plan of the Mount Polley Mine is shown on Drawing 11162-13-100.

Mill tailings are discharged as a slurry into the Tailings Storage Facility which has been designed to provide environmentally secure and long term storage of the solid waste. As the solids settle out of the slurry, process fluids are collected and recycled back to the mill for re-use in the milling process. There is no surface discharge of any process solution from the Tailings Storage Facility.

The Main and South Embankments were raised to Stage 3A (El. 942.5 m) during the 2000 construction program, while the Perimeter Embankment was raised to accommodate the 2001 spring freshet (Zone S to El. 941.5 m and upstream Zone CS to El. 942.5 m). Work started in June 2000 and finished in April 2001. Knight Piésold Ltd. provided design, construction supervision and quality assurance/quality control (QA/QC) services for these embankment raises.

1.2 SCOPE OF REPORT

This report covers the annual inspection of the Tailings Storage Facility for the period March 2000 to April 2001. It includes an evaluation of all pertinent operating data, as well as instrumentation and monitoring results collected over the past year and from start-up to date.

This document does not include monitoring protocols for the upcoming care and maintenance period when the mine temporarily suspends operations in the fourth quarter of 2001. These procedures will be included in a Care and Maintenance Manual which will be published by MPMC late in 2001.

1.3 TAILINGS STORAGE FACILITY

The Tailings Storage Facility is comprised of the following:

- A pipeline system conveys the tailings slurry via gravity from the Millsite to the Tailings Storage Facility. This system includes movable discharge sections with one end dump discharge to distribute the tailings along the embankment crest.

- A make-up water supply system provides extra water to the Tailings Storage Facility. This serves as a temporary storage and transfer point prior to pumping to the mill. This system comprises an intake and pump at Polley Lake and a pipeline to convey water to the Tailings Storage Facility. The water is discharged into the Tailings Storage Facility near the West abutment of the Perimeter Embankment.

- A Millsite Sump and Southeast Sediment Pond provide additional make-up water to the system by collecting drainage from the millsite and Southeast Waste Dump. Millsite runoff is directed from the Millsite Sump into the tailings line near the mill. Flows from the Southeast Sediment Pond enter the system at the reclaim booster pump station or at the T2 Tailings Drop Box.

- Graded earthfill and rockfill embankments with internal filters and drains retain the tailings solids in the Tailings Storage Facility. The embankments have been raised in stages by a combination of centreline and modified centreline approaches. A 5 metre high downstream rockfill buttress has been constructed at the Main Embankment to enhance embankment stability. This buttress is located from the valley bottom to El. 920 m and comprises the following zones and materials:

  ⇒ Zone S - fine grained glacial till which provides the core zone.
  ⇒ Zone CS - cycloned sand which provides for the upstream shell.
  ⇒ Zone B - fine grained glacial till which provides for shell zones.
  ⇒ Zone F - processed gravel and sand which provides for the filter blanket and chimney drain.
  ⇒ Zone T - select rockfill which provides for the transition zone.
  ⇒ Zone C - rockfill which provides for the downstream shell zone.

- A low permeability basin liner (natural and constructed) covers the base of the entire facility to provide containment of process fluids and to minimize the potential for seepage.

- A foundation drain and pressure relief well system located downstream of the Stage 1B Main Embankment prevent the build-up of pore pressure in the foundation and collect seepage from the base of the Tailings Storage Facility.

- Seepage collection ponds located downstream of the Main and Perimeter Embankments were excavated in low permeability soils to store water collected from the embankment drains and from local runoff. Water from these ponds is pumped back into the Tailings Storage Facility and ultimately to the mill for use in the milling process.

- Instrumentation in the tailings, embankments and foundations, including vibrating wire piezometers, survey monuments and the measurement of drain flows, is used to monitor the performance of the Tailings Storage Facility.

- A reclaim water system, comprised of a barge mounted pump station in an excavated channel, an in-line booster pump station and a pipeline for recycling process water to the mill, is used to remove water from the Tailings Storage Facility for use in the mill process.

- A system of monitoring wells installed around the Tailings Storage Facility is used for groundwater quality monitoring.

All of the components listed above were reviewed as part of the 2000 and 2001 Annual Inspection.

SECTION 2.0 – 2000 AND 2001 ANNUAL INSPECTION

2.1 GENERAL

Regular on-going inspections of the Tailings Storage Facility and Ancillary Works have been conducted to ensure that the safety and security of the system remains high and to meet the guidelines of the Ministry of Energy, Mines and Northern Development. A formal inspection was conducted by Mr. Ken Brouwer, P.Eng., on April 25, 2001, and various other inspections and reviews of monitoring data have been routinely conducted by Mr. Wilson Muir, P.Eng during the current phase of construction. Selected photographs of the TSF and associated works are included in Appendix A.

2.2 EMBANKMENT CONSTRUCTION

The majority of Stage 3A construction was completed at the time of the inspection on April 25 2001. The embankment crest had been raised to El. 942.5 m on the Main and South Embankments and the Zone S had been raised to El. 941.3 m on the Perimeter Embankment. MPMC was completing construction of the upstream Zone CS berm to El. 942.5 m on the Perimeter Embankment at the time of Mr. Brouwer's inspection.

2.3 INSPECTION OF FACILITY

The supernatant pond was at El. 939.9 m at the time of Mr. Brouwer's inspection on April 25 2001. Tailings were being discharged along the south side of the impoundment. The tailings header extended along the Main Embankment to Ch. 17+00, and terminated at a single discharge point. The short term deposition plans called for extending the line to accelerate beach development in the southwest corner of the impoundment. Tailings beaches were exposed along the Perimeter and Main Embankments from approximate Chainage 16+50 to 45+00.

Other notable observations made at the Tailings Storage Facility include:

- No cracks were observed on the crest. The fill slopes for the Main and Perimeter Embankments exhibited no signs of instability, although the downstream glacial till slope at the Perimeter Embankment had been oversteepened after removal of some saturated spoil material.

- The tailings beach at the northwest corner of the impoundment had encroached very close to the elevation of the Perimeter Embankment, due to intermittent discharges from the M1A dump valve and at approximate Chainage 29+00 throughout 2000 and early 2001.

- The Seepage Collection Pond recycle pipelines at both the Main and Perimeter Embankments were discharging well upstream of the embankments and no erosion at the upstream toes of the embankments were observed. The Seepage Collection Ponds (SCPs) for the Main and Perimeter Embankments were observed to be in good condition. Minor erosion was observed on the north slope of the Main Embankment SCP, but no other evidence of wear was observed. The maximum pond levels were well below the overflow culverts and MPMC reported no uncontrolled discharges from the SCPs.

- No unexpected or uncontrolled seepage was observed from the embankments, including the fill slopes and foundations, with the exception of trapped local runoff filtering through the Zone T haul road at the left abutment of the Perimeter Embankment. This seepage is discussed in Section 3.5.

- Vehicle traffic during operations had caused ruts to develop on the embankment crests.

- The outlets for the Main Embankment Foundation Drains FD-1 to FD-5 were monitored for flows throughout the past winter. The latest drain flow monitoring data is presented in Table 3.5 and plots of the data are shown in Appendix C. The outlets of the drains were observed to be above the pond level in the Main Embankment SCP at the time of inspection.

- The Main Embankment Upstream Toe Drain has been functioning for some time. Flow measurements from past readings are available on Table 3.5. Graphs of the upstream toe drain flows are presented in Appendix C.

- The three Outlet Drains from the Main Embankment Chimney Drain that exited from the Stage 1B embankment were covered by rockfill during Stage 3A Construction. Flows from these drains continue to exit through a filter zone and then into the coarse rockfill of the downstream shell. Ongoing monitoring of these flows was not required as they were observed to be extremely small (less than 1 litre/min). As a result, the pipeworks were not extended during the previous design.

- The Zone T Haul Road was observed to be in very good condition. The surface had been coated with some fines and may require scarification before it is covered by other materials in future construction programs.

- The exposed basin liner from the expansion program in 2000 was inspected and was found to be in good condition, with no significant damage from erosion observed. No springs or seeps were observed.

- All perimeter ditches were unobstructed and were flowing with clear runoff.

In general, the Tailings Storage Facility was observed to be in good condition. Selected photos of the Tailings Storage Facility are included in Appendix A.

SECTION 3.0 - EMBANKMENT PERFORMANCE

3.1 PIEZOMETER DATA

3.1.1 General

A total of 56 vibrating wire piezometers have been installed at the Tailings Storage Facility to date, which include several replacement piezometers. The piezometer locations are shown on Drawings 11162-13-250, 251, 254, 256, 258 and 259. The piezometers are grouped into tailings piezometers, foundation piezometers, embankment fill piezometers and drain piezometers. The results from each group are discussed below.

3.1.2 Tailings Piezometers

A total of 9 piezometers have been installed in the tailings to date, of which seven remain in operation. Three of these piezometers are present in mechanically placed Zone CS fill. Three piezometers are located on each of Plane A, B and C, as shown on Drawings 11162-13-250 and 258. The non-functioning ones are on Plane C and are identified as C0-PE2-01 and C0-PE2-02.

A summary of the tailings piezometer monitoring data is presented on Table 3.1. Timeline plots of the tailings piezometer data are included in Appendix B1. The results show that with the exception of B0-PE1-01, the pore pressures are below the pond level in the Tailings Storage Facility. This confirms that the tailings mass at these locations is draining and consolidating as intended. At piezometer B0-PE1-01, the pore pressure is slightly above the pond level. This may be the result of recent tailings deposition in the area above this piezometer.

3.1.3 Embankment Foundation Piezometers

A total of 20 piezometers have been installed in the embankment foundations to date. Eighteen are currently in operation. These piezometers are located on

Planes A through F, as shown on Drawings 11162-13-250, 251, 254, 258 and 259. The non-functioning ones are on Planes C and F and are identified as C2-PE2-01 and F2-PE2-01.

Artesian conditions are present in the foundation under the Main Embankment. The piezometers in this area are used to monitor the pore pressures and to confirm that they remain below the threshold level of 6 metres above ground level. No unexpected high pore pressure increases were noted during the reporting period. The table below summarizes the artesian head values (above ground surface level) reached during the reporting period.

Piezometer	Maximum Artesian Pressure Attained (m)
A2-PE1-03	2.0
A2-PE2-01	3.9
A2-PE2-02	-0.2
A2-PE2-06	3
A2-PE2-07	2.2
A2-PE2-08	1.1
B2-PE1-03	-0.4
B2-PE2-01	1.7
B2-PE2-02	4.1
B2-PE2-06	-0.2
C2-PE1-03	0.2
C2-PE2-02	1.7
C2-PE2-02	1.1
C2-PE2-02	-0.7
C2-PE2-02	-0.8
D2-PE2-02	-1.5
E2-PE2-01	-1.2
E2-PE2-02	-1.2

Although the highest level recorded is 4.1 m, none have reached the foundation piezometer trigger level of 6.0 m artesian pressure relative to original ground. All stability analyses completed at the Main Embankment use an artesian pressure of 6.0 m for the glaciolacustrine unit. As a result, these calculations are conservative since all recorded values during the last year are below the trigger level.

It has been noted that artesian pressures have typically developed in the deeper piezometers, at elevations below El. 910 m. This corresponds roughly to the top of the glaciolacustrine/glaciofluvial material and these artesian pressures are therefore not unexpected (Planes A, B and C). It should also be noted that no artesian conditions have been encountered at Plane E, where coarser glaciofluvial material is present.

Another trend that has developed is that many of the pore pressures of the foundation piezometers have increased slightly over time. This is likely due to tailings deposition and rising pond level over the life of the mine.

A summary of the embankment foundation piezometer monitoring data is presented on Table 3.2. Timeline plots of the embankment foundation piezometers are included in Appendix B2.

3.1.4 Embankment Fill Piezometers

A total of 16 piezometers have been installed in the embankment fill materials to date. These include 12 in Zones S or B (glacial till) and 4 in Zone T. Of the 16 piezometers installed, 14 remain in operation (10 in Zones S or B and 4 in Zone T). These piezometers are located in Planes A through D, as shown in the plan view on Drawings 11162-13-250 and 251. Drawings 11162-13-258 and 259 show the piezometer installation locations and the latest piezometric elevation readings in section views of the embankments.

Plane A Piezometers

Piezometer A2-PE1-02 is located in the upper portion of the Main Embankment in Zone S, upstream of the internal chimney drain. The piezometric time plot is shown in pink on Figure B3-1. These data indicate:

- The piezometric elevation comprises a combination of undrained construction pore pressures from two stages of embankment construction and steady state pore pressures from the surface water pond.
- The construction pore pressures are dissipating with time.
- The piezometric level will decrease below the current surface water pond elevation when all construction pore pressures have fully dissipated.

Piezometer A2-PE2-03 is located in the central portion of the Main Embankment in Zone S, upstream of the internal chimney drain. The piezometric time plot is shown in purple on Figure B3-1. These data indicate:

- The piezometric elevation comprises a combination of undrained construction pore pressures from four stages of embankment construction and steady state pore pressures from the surface water pond.
- The construction pore pressures appear to have fully dissipated from one construction stage to the next.
- The remaining steady state pore pressures at the end of each stage have increased from stage to stage as a result of the increasing surface water pond level.
- At present, the piezometric elevation of 930 m is approximately 10 m below the current surface water pond elevation of 939.9 m, which indicates that there is a substantial head loss on seepage through the fill upstream of the chimney drain.

Piezometer A2-PE2-05 is located in glacial till, downstream of the internal chimney drain and between Outlet Drains OD-1 and OD-2. The piezometric time plot is shown in brown on Figure B3-1 and has remained at an approximate constant elevation head value of 922 m (no piezometric head) since its installation. This indicates that the outlet drains situated nearby continue to function adequately by draining any potential pore pressure increase.

Piezometer A2-PE1-01 is located in Zone T fill at the downstream toe of the embankment and is shown in blue on Figure B3-1. This piezometer shows zero or negative pore pressures which indicates that the fill is freely drained in this area.

Plane B Piezometers

Piezometer B2-PE1-02 is located in the upper portion of the Main Embankment in Zone S, upstream of the internal chimney drain. The piezometric time plot is shown in pink on Figure B3-2. These data indicate:

- The piezometric elevation comprises a combination of undrained construction pore pressures from two stages of embankment construction and steady state pore pressures from the surface water pond.
- The construction pore pressures are dissipating with time.
- The piezometric level will decrease below the current surface water pond elevation when all construction pore pressures have fully dissipated.

Piezometer B2-PE2-03 is located in the central portion of the Main Embankment in Zone S, upstream of the internal chimney drain. The piezometric time plot is shown in purple on Figure B3-2. These data indicate:

- The piezometric elevation comprises a combination of undrained construction pore pressures from seven stages of embankment construction and steady state pore pressures from the surface water pond.
- This piezometer reacted strongly to fill placement during initial construction. Pore pressures did not dissipate in the periods following fill placement, but remained constant. This is in direct contrast to other

instruments located nearby. This trend changed in 1999, when B2-PE2-03 began to show dissipation at the completion of fill placement. This new trend has been repeated three times, with approximately the same dissipation rate after each stage of construction, with an increase in pore pressure between 50 and 100% of the increase in total stress. It appears that drainage paths were limited in the fill around this piezometer and pore pressures are still equilibrating.

Piezometer B2-PE2-04 is located in the central portion of the Main Embankment in Zone S, upstream of the internal chimney drain and downstream of piezometer B2-PE2-03. The piezometric time plot is shown in brown on Figure B3-2. These data indicate:

- The piezometric elevation comprises a combination of undrained construction pore pressures from four stages of embankment construction and steady state pore pressures from the surface water pond.
- The construction pore pressures fully dissipated following Stage 1 Construction (El. 934 m) and Stage 2A Construction (El. 936 m). The pore pressures following Stage 3A construction (El. 942.5 m) are a combination of construction pore pressures and steady state conditions.
- The remaining steady state pore pressures at the end of each stage have increased from stage to stage as a result of the increasing surface water pond level.
- At present, the piezometric elevation of 929.5 m is approximately 10 m below the current surface water pond elevation of 939.9 m, which indicates that there is a substantial head loss on seepage through the fill upstream of the chimney drain.

Piezometer B2-PE2-05 is located in glacial till, downstream of the internal chimney drain. This piezometer is located in the same position on section as piezometer A2-PE2-05; however, piezometer B2-PE2-05 is far away from any outlet drains. The piezometric time plot is shown in light blue on Figure B3-2. These data show:

- The construction pore pressures fully dissipated following Stage 1 Construction to the installation elevation of 922 m.
- The construction pore pressures are currently dissipating after Stage 3A Construction. It is expected that these pore pressures will fully dissipate to the installation elevation of 922 m.
- No steady state pore pressures have built up in the fill near this piezometer. This confirms that the chimney drain is lowering the phreatic surface as intended in the design.

Piezometer B2-PE1-01 is located in Zone T fill at the downstream toe of the embankment and is shown in blue on Figure B3-2. This piezometer shows near zero or negative pore pressures which indicates that the fill is freely drained in this area.

Plane C Piezometers

Piezometer C2-PE1-02 is located in the upper portion of the Main Embankment in Zone S, upstream of the internal chimney drain. The piezometric time plot is shown in pink on Figure B3-3. These data indicate:

- The piezometric elevation comprises a combination of undrained construction pore pressures from two stages of embankment construction and steady state pore pressures from the surface water pond.
- The construction pore pressures are dissipating with time.
- The piezometric level will decrease below the current surface water pond elevation when all construction pore pressures have fully dissipated.

Piezometer C2-PE2-05 is located in the central portion of the Main Embankment in Zone S, upstream of the internal chimney drain. The piezometric time plot is shown in brown on Figure B3-3 and is no longer functioning. These data indicate:

- The piezometric elevation comprises a combination of undrained construction and steady state pore pressures from the surface water pond.
- The instrument historically shows little or no reaction to construction, but indicates a slow, steady increase in pore pressure over time. This suggests that pore pressures in the fill around C2-PE2-05 are reaching a steady state condition as the phreatic surface moves through the fill.
- The piezometric elevation of the piezometer when it stopped functioning was about 935 m, which was approximately 3 m below surface water pond elevation at that time. This indicates that there was substantial head loss on seepage through the fill upstream of the chimney drain.

Piezometer C2-PE2-03 is located in glacial till, upstream of the internal chimney drain and downstream of piezometer C2-PE2-05. The piezometric time plot is shown in purple on Figure B3-3. These data indicate:

- The construction pore pressures generated following two stages of construction have fully dissipated.
- The current piezometric elevation is very close to the installation elevation, which suggests the fill in this area is well drained and that no steady state pore pressures have been generated.

Piezometer C2-PE1-01 is located in Zone T fill at the downstream toe of the embankment and is shown in blue on Figure B3-3. This piezometer shows near zero or negative pore pressures which indicates that the fill is freely drained in this area.

Plane D Piezometers

Plane D Zone S piezometer D2-PE2-01 is shown in pink on Figure B3-4 and is located in the central portion of the Perimeter Embankment. This piezometer shows a steady increase in pore water pressure over time, which suggests that the piezometer is responding to the approach of steady state conditions from the surface water pond.

Piezometer D2-PE1-01 is located in Zone T fill at the downstream toe of the embankment and is shown in blue on Figure B3-4. This piezometer shows near zero or negative pore pressures which indicates that the fill is freely drained in this area.

A summary of the embankment fill piezometer monitoring data is presented on Table 3.3. Timeline plots for the embankment fill piezometers are included in Appendix B3.

3.1.5 Drain Piezometers

A total of 11 piezometers had been installed in components of the embankment drains to date including foundation drains,chimney drain and outlet drains. All 11 were functioning at the time of inspection. These piezometers are located on Planes A through D, as shown on Drawings 11162-13-250, 251, 258 and 259.

All drain piezometers showed near-zero pore pressures, indicating that the drains are functioning as intended. A summary of the drain piezometer monitoring data is presented on Table 3.4. Timeline plots for each drain piezometer are included in Appendix B4.

3.2 DRAIN FLOW DATA

Flows from the 5 Foundation Drains and 2 Upstream Toe Drain outlets at the Main Embankment are monitored on a weekly basis. The results are shown on Table 3.5. The graph of the outlet drain data is shown on Figure C-1 in Appendix C while the graph of the foundation drain data is shown on Figure C-2 in Appendix C. Locations of the drains are shown on Drawings 11162-13-250.

The Upstream Toe Drain flow data for the ME West and ME East outlets show flows that vary substantially. This is likely due to the areas of tailings deposition being changed over time. The PE South outlet shows very low flows since this outlet is actually a continuous non-perforated extension of the Main Embankment Upstream Toe Drain. As a result, flows that are not discharged through the ME East outlet continue through the pipe to the PE South outlet.

There is a large gap in the foundation drain data from the end of 1998 to the summer of 2000. This was a result of the water level in the SCP being higher than the outlet elevations of the foundation drains. MPMC experienced problems with the pump at the SCP; therefore, the SCP water level was maintained at a slightly elevated level which flooded the drains. As a result, the flows exiting the drains could not be monitored.

The flow measurements increased dramatically in the fall of 2000 once the pumping system became operational. This was likely due to water backing up in the foundation drain gravel during the period of high water elevations at the SCP. This water then re-entered the SCP as the elevation in the pond was lowered.

A second increase in flows was seen during the spring freshet of 2001, especially in FD-2 and FD-5. These two drains have been extended and now are exposed against rockfill. As a result, these two drains intercept local runoff from snowmelt and rainfall events. FD-5 was again extended in the fall of 2000 to intercept a groundwater seep observed in the foundation materials at the right abutment of the Main Embankment. These events likely explain the increase in flows over this period.

Samples from the Foundation Drains and the Upstream Toe Drain are collected by MPMC for water quality testing. The results are available from MPMC and are reported in the Annual Environmental reports submitted to the appropriate agencies (Ministry of Environment, Lands and Parks and Ministry of Energy, Mines and Northern Development).

The three Outlet Drains for the Main Embankment Chimney Drain that exited from the Stage 1B embankment were not extended during Stage 3A Construction due to historic very low flows (less than 1 liter/min). The drain pipes were capped and covered with filter fabric prior to placement of Zone T transition material. Water from the Outlet Drains now flows through the permeable gravel surrounding the pipe, through transition and rockfill zones and is captured in the Main Embankment Seepage Collection Pond.

3.3 SURVEY MONUMENT DATA

The survey monuments installed on the crests between construction phases have not been monitored on a regular basis. Six (6) survey monuments will be installed on the Stage 3B embankment crest following 2001 construction at Planes A through D, Plane G and Plane H. Drawings 11162-13-250, 251, 258 and 259 show the locations of these monuments, while Drawing 11162-13-256 displays the details of the monuments.

3.4 STABILITY

3.4.1 Main Embankment

A stability review of the Stage 3 Main Embankment was carried out by Knight Piésold in January 2001. The review showed that the pore pressures used during previous stability analyses were greater than pore pressures measured by the piezometers in the field. In addition, trigger levels of the piezometers were reviewed. The placement of the downstream rockfill buttress increased the embankment stability; therefore, the conservatism of the trigger levels was increased.

The last formal stability analyses for the Main Embankment were completed in December 1999 and were based on a downstream cycloned sand configuration. Results are presented in the Knight Piésold document "Report on Cycloned Sand Construction of Stage 3 and Ongoing Stages of the Tailings Storage Facility", Ref. No. 11162/12-2, December 13, 1999.

Internal stability analyses were completed in May 2000 to confirm the stability of the rockfill design.

It was recommended that two (2) slope inclinometers be installed at the base of the Main Embankment during the 2001 construction program to confirm that any displacements of the embankment are measured and are minimal. The inclinometers were installed in July, 2001 and extend through the overconsolidated glaciolacustrine foundation layer and into bedrock at depth.

3.4.2 Perimeter Embankment

Static stability analyses were carried out for the Stage 3B Embankment (El. 945 m) in March 2001. The results in terms of limit equilibrium Factors of Safety are as follows:

Downstream Static	Upstream Static	Upstream Post Liquefaction
Min FoS required = 1.3	Min FoS required = 1.3	Min FoS required = 1.2
FoS Calculated = 2.0	FoS Calculated = 2.0	FoS Calculated = 1.2

In addition to the above results, psuedostatic analyses were carried out to determine the yield accelerations necessary to trigger substantial embankment deformations. The yield accelerations calculated to bring the FoS to unity were determined to be significantly greater than the yield accelerations produced by the Operational Basis Earthquake (OBE) and the Maximum Design Earthquake (MDE) for the facility. This indicates that seismically induced movement of the embankment, if any, will be minimal.

These results indicate that the Stage 3B embankment will be stable. A copy of the letter to MPMC that presents the stability analyses is presented in Appendix D.

3.5 SEEPAGE

No unexpected seepage associated with the embankments was observed during the inspection.

Some seepage was observed at the left abutment of the Perimeter Embankment, but the source of this seepage is water from a ditch adjacent to the Polley Lake pipeline access road. It is believed that this water originates from rainfall and local runoff from the surrounding area. The culvert that transfers water under the road and into the ditch to the Perimeter Embankment Seepage Collection Pond is slightly elevated and water pools at the inlet. This causes the seepage which exits at the base of the embankment but seeps back into the Zone T road and the ditch at Setting Out Point S7. The observed flow rate is very low and the water is clear. The area below the embankment at this location is scheduled to be covered with material during Stage 3B Construction.

SECTION 4.0 - MANAGEMENT OF FACILITY

4.1 TAILINGS DEPOSITION

Tailings have been discharged from the M1 dump valves, by end spilling at flanged connections and by cycloning inside the impoundment. Short term plans called for concentrating the beach development in the southwest corner of the impoundment to raise the beach in this area. This was completed throughout the summer of 2001.

4.2 FILLING SCHEDULE AND TAILINGS DENSITY

The updated filling schedule and staged construction sequence for the facility, assuming on-going operations until 2009, are shown on Figure 4.1. The average mill throughput for 2000 was reported to be approximately 16,000 tonnes/day, and the projected throughput for the period of 2001 to 2009 is approximately 20,000 tonnes/day. Measured water levels for the supernatant pond to date and forecasted future levels which have been determined using information provided by MPMC are plotted on the figure. MPMC continually track and update the project water balance.

The tailings surface (above and below a pond at El. 940.20 m) was surveyed by MPMC on May 10, 2001. At the time of the survey, a total of 24,611,000 dry tonnes of tailings with a specific gravity of 2.65 had been deposited into the facility. The following data was derived from the survey:

• Tailings Volume	16,786,000 m^3
• Tailings Volume Below Water Elevation:	16,561,000 m^3
• Tailings Volume Above Water Elevation:	225,000 m^3
• Average Tailings Dry Density	1.47 tonnes/ m^3
• Average Tailings Porosity	0.447
• Average Tailings Void Ratio	0.802
• Available Supernatant Water Volume	2,429,000 m^3
• Water Volume Trapped in Voids	7,500,000 m^3
• Exposed Tailings Beach Area	57.8 ha
• Supernatant Pond Area	118.7 ha

The TSF filling schedule on Figure 4.1 incorporates a lower (more conservative) tailings dry density (1.36 tonnes/m^3) than the calculated average value to build in some contingency storage in the facility.

The updated filling schedule for the Tailings Storage Facility indicates that a Stage 3 crest elevation of 942.5 m is sufficient to meet storage and freeboard requirements until the fourth quarter of 2001, when the mill is currently planned to be shut down. MPMC plans to construct drainage ditches to route runoff away from the TSF and into adjacent catchment areas to keep inflows into the TSF to a minimum. These actions combined with periodic pumping from the supernatant pond to the Cariboo open pit will keep the pond level low and allow for storage of the 24-hour Probable Maximum Precipitation event (679,000 m^3) plus 1 metre for wave run-up.

4.3 WATER BALANCE

The water balance developed for the Tailings Storage Facility is updated regularly by MPMC. The water balance is updated with temperature, precipitation, evaporation, snowpack, ice cover and other relevant data as it becomes available. MPMC also conducts periodic surveys of the tailings surface above and below the supernatant pond to confirm the water storage capacity of the facility. All of this information is used to predict the amount of water that will be available for reclaim and the amount of water required to be pumped in from Polley Lake to adequately supply the mill while maintaining a minimum amount of freeboard. Knight Piésold Ltd. provides input and review of the water balance on an as needed basis. A copy of the water balance is not included in this report. Details are presented in annual Water Management Plan reports submitted to the appropriate agencies (Ministry of Environment, Lands and Parks and Ministry of Energy, Mines and Northern Development).

To date, the Tailings Storage Facility has generally been operated in accordance with the objectives of the water balance. This includes maintaining a maximum of 2 to 2.5 million cubic metres of water in the impoundment as a supply for reclaim to the mill with certain freeboard allowances above this, as discussed below.

4.4 FREEBOARD

The Tailings Storage Facility includes the capacity for live storage of the 24-hour PMP volume of 679,000 cubic metres at all times. The 24-hour PMP allowance is in addition to regular inflows from other precipitation runoff, including the spring freshet. The Tailings Storage Facility design also incorporates an allowance of 1 metre of freeboard for wave run-up around the perimeter. The Tailings Storage Facility has been operated with both the PMP and the additional wave run up freeboard.

4.5 RECLAIM WATER

Reclaim water removed to the mill has been monitored by MPMC and the volume data is included in the project Water Management Plan reports. To date, water recovery volumes have been able to meet the process demands. This has been accomplished by careful management of the water balance.

The quality of the reclaim water remains similar to that reported previously. The pH is slightly basic, in the range of 7.2 to 8.3. The water is turbid, with greater than 230 ppm total suspended solids (TSS). To date, process water quality has met the requirements of the milling operations.

4.6 EXTERNAL WATER

Water quality monitoring of external water is carried out regularly by MPMC staff. Monitoring includes surface water quality from ditches, streams, creeks and lakes, as well as groundwater quality from monitoring wells. The results of the water quality monitoring have been reported by Mount Polley in the report "2000 Annual Environmental Report, Effluent Permit 11678". This report has been submitted to the appropriate agencies (Ministry of Environment, Lands and Parks and Ministry of Energy, Mines and Northern Development).

SECTION 5.0 - ANCILLARY WORKS

5.1 GENERAL

Items that were inspected and are termed "Ancillary Works" include the tailings and reclaim pipeline systems, Southeast Sediment Pond, Polley Lake Pumping System, Millsite Sump and South Bootjack Dam. These items are discussed separately in the following sections.

5.2 TAILINGS AND RECLAIM PIPELINE CORRIDOR

5.2.1 Tailings Pipeline System

The tailings pipeline system consists of a 7 km HDPE pipe of varying diameters and pressure ratings to convey tailings from the mill to the Tailings Storage Facility, as shown on Drawing 11162-13-100. A drop box is located approximately 3 km from the millsite to dissipate any dramatic head increases. The line is situated in a containment ditch which can transfer any tailings overflow directly to the Tailings Storage Facility.

Tailings overflowed from the T2 Drop Box to the Overflow Pond and along the containment ditch to the Tailings Storage Facility a few days prior to the inspection. All tailings were contained in the Overflow Pond and containment ditch. Tailings were observed to be present in the ditch from the Drop Box to the M1A dump valve at the time of the inspection. MPMC was in the process of removing tailings from the ditch during the inspection. The channel section from the T2 Drop Box to the M1A dump valve was in good condition and adequately accommodated the tailings.

An inspection of the pipelines and sleeves at the Bootjack Creek Crossing indicated that tailings had flowed through the sleeves, as tailings were present in the ditch on the downstream side of the culverts. The CSP sleeves must be flushed to ensure that there is a clear pathway for any future tailings to get past the crossing, without backing up and spilling into Bootjack Creek.

The fill slopes at the Bootjack Creek Crossing appeared to be stable, with no signs of cracking or slumping. The water flowing in Bootjack Creek was clear at the time of the inspection. The ditch on the north side of the road approaching Bootjack Creek is lined with rock to minimize erosion and this rock was observed to be in good shape. The pipe arch culvert carrying the creek under the road was observed to be in good condition, with no significant deflections or obstructions.

The water level in the T2 Drop Box was low and tailings were not backing up in the pipeline at the time of inspection. A fraction of the flow from the Southeast Sediment Pond that can be routed through the drop box to clean it out has not been required to this point.

At the time of inspection, tailings were being removed from the T2 Overflow Pond. The spillway was observed to be in good condition. The T2 Overflow Pond should be kept free of tailings at all times and must be cleaned out immediately after any future tailings overflow events.

After initial problems with the tailings pipeline system, the T2 Drop Box was revised and now acts as a pressure relief point for the pipeline. In addition, valves have been strategically placed between the T2 Drop Box and the M1A dump valve to remove pressurized air within the pipeline. Studies are under way to further reduce head losses in the pipeline and discharge tailings at the southwest corner of the tailings impoundment.

MPMC staff carry out daily inspections of the tailings pipeline during operations and inspect the line for wear when symptoms (i.e. leaks) are observed.

Selected photos of the tailings pipeline corridor are included in Appendix A.

5.2.2 Reclaim Pipeline System

The reclaim pipeline system consists of a 7 km 24 inch diameter HDPE pipeline of varying pressure ratings to transfer reclaim water from the reclaim barge to the millsite. MPMC staff conduct daily inspections of the reclaim pipeline system. The reclaim pipeline system is working well and there have been no problems with the system to date. MPMC has modified the system by removing the steel pipe section near the barge. The steel section was no longer required due to decreases in pumping requirements and length from the steady rise in pond level. Barge moves are completed by MPMC on an as-needed basis. The barge was moved approximately 40 m upstream in 2000.

Selected photos of the reclaim pipeline system are included in Appendix A.

5.3 SOUTHEAST SEDIMENT POND

The Southeast Sediment Pond collects runoff from the Southeast Waste Dump via the Southeast Waste Dump runoff ditch. Water from the pond is then transferred to the reclaim or tailings line through a series of sumps and pipelines.

Seeps were observed in the northwest fill slope of the Southeast Sediment Pond embankment. Seeps have been observed in this area since 1997. Additional seeps were observed further east and in an area where waste material and a topsoil pile is located. All seepage was observed to be clear, indicating that no erosion of fill materials was occurring. The seeps are likely attributed to an elevated groundwater table, which is temporarily higher during the freshet season. Tension cracks at the waste and topsoil pile have been reported in the past; however, no further signs of instability were observed during the inspection. The vegetation on the slopes of the waste dump and topsoil pile were observed to be well established.

Other observations made at the Southeast Sediment Pond and Southeast Waste Dump runoff ditch are:

- Water flowing in the ditch was clear.
- The overflow culvert for the pond was clear of obstructions.

- The embankment fill slopes (inside and outside) looked to be in very good shape, with no signs of instability. No cracks were observed on the crest. No seepage or slumping of the slopes was observed.

- The re-vegetation has become well established on the embankment.

MPMC staff carry out monthly inspections of the Southeast Sediment Pond. Observations are recorded on an inspection sheet. The pond is inspected weekly during the spring freshet or after heavy rainfall.

Selected photos of the Southeast Waste Dump runoff ditch and Southeast Sediment Pond are included in Appendix A.

5.4 POLLEY LAKE PUMPING SYSTEM

The Polley Lake pumping system was not in operation at the time of the inspection. However, a total of 400,000 cubic metres of water was pumped from Polley Lake in 2000 and approximately 450,000 cubic metres will be pumped in 2001. The pump and lined oil/fuel containment areas were inspected for oil or fuel leaks but no evidences of leakage were observed. MPMC staff carry out daily inspections of the Polley Lake Pumping System while the system is operating.

All culvert crossings were flowing with clear runoff, including the pipe arch culvert over Bootjack Creek. The pipe arch culvert appeared to be in good shape, with no significant deflections observed.

5.5 MILLSITE SUMP

Total flow directed through the Millsite Sump in 2000 was estimated to be approximately 104,000 cubic metres, as measured with a flow meter. It is estimated that 50,000 cubic metres of water will pass through the Millsite Sump in 2001. The prediction for the coming year is much lower than the value reported for 2000 due to the larger than average snowpack in 2000 and the smaller than average snowpack in 2001.

The embankments at the Millsite Sump were observed to be in good shape and the re-vegetation appeared to be well established. No cracks, seepage or slumping was noted. The emergency overflow culvert was clear of obstructions. The culvert was installed to prevent overtopping of the embankments in the unlikely event of a prolonged shut down of the pump coupled with a blockage of the drain into the tailings pipeline. Flows into the sump through a series of small pipes conveying local runoff appeared to be unobstructed. MPMC had not made any modifications to the Millsite Sump since the last inspection.

5.6 SOUTH BOOTJACK DAM

The South Bootjack Dam was observed to be in good condition at the time of the inspection. Observations included:

- The water level was low.
- Both upstream and downstream fill slopes were in good condition, with no evidence of seepage or slumping.
- No cracks were observed on the dam crest.
- The spillway contained some vegetation, but was generally unobstructed.

Selected photos of the South Bootjack Dam are included in Appendix A.

SECTION 6.0 - SUMMARY AND RECOMMENDATIONS

6.1 GENERAL

The annual inspection reported herein was completed to ensure that the safety and security of the Tailings Storage Facility and ancillary works remains high and to meet the guidelines of the Ministry of Energy, Mines and Northern Development. Observations were made during an April 25, 2001 site visit by Mr. Ken Brouwer, P.Eng. and during the initial stages of Stage 3B Construction by Mr. Wilson Muir, P.Eng.

6.2 TAILINGS STORAGE FACILITY

Significant points related to the Tailings Storage Facility are summarized below:

- Construction of the Stage 3A tailings embankments was almost complete during the time of inspection. The Main and South Embankments were raised from El. 941 to El. 942.5 m. The Zone S at the Perimeter Embankment was raised from El. 941 to El. 941.3 m while the upstream Zone CS was being raised to El. 942.5 m at the time of inspection.

- The Tailings Storage Facility embankments were observed to be in good condition. No seepage or slumping was observed. Saturated loose material on downstream slopes at the Perimeter Embankment must be removed prior to the next phase of construction. The embankment stability has been confirmed using updated geometry and material parameters.

- The Seepage Collection Ponds were operating normally. Flow monitoring of the Foundation Drains and Upstream Toe Drain was carried out throughout the past winter and were found to be within seasonal flow ranges.

- The culvert referred to in Section 3.5 should be lowered so that all water in the ditch on the Polley Lake access road reports to the Perimeter Embankment

Seepage Collection Pond ditch without backing up and causing seepage through the road fill.

- The Main Embankment Outlet Drains have been capped and covered by Stage 3A rockfill but this is acceptable since the reported flow rates were very small. All of this water ultimately reports to the Main Embankment Seepage Collection Pond.

- Piezometer data indicated that the embankments are performing as designed.

- The tailings volume and storage density calculations have been updated by MPMC. The results indicate that the average tailings dry density is 1.47 tonnes/cubic metre in the facility which is higher than the value of 1.36 used in the storage capacity calculations.

- The facility is being operated in accordance with the water management requirements of the design. The specified capacity for temporarily storing runoff from the design storm and the minimum freeboard wave run-up has been maintained.

Recommendations for on-going operations of the Tailings Storage Facility are summarized below:

- Continue to discharge tailings upstream of the ridge between the Main and South Embankments to establish a well defined beach in this area.

- Continue to closely monitor the filling rate and water balance.

- Continue regular weekly monitoring of the vibrating wire piezometers and drain flows (Foundation Drains and Upstream Toe Drain) during operations.

- Continue regular monitoring of the water quality and levels in the surrounding groundwater wells. Continue regular water quality monitoring of the Foundation Drains.

MPMC staff are currently implementing the above recommendations.

6.3 ANCILLARY WORKS

6.3.1 General

Summaries and recommendations for the Ancillary Works presented in this annual report are summarized below.

6.3.2 Tailings Pipeline System

- The tailings pipeline containment ditch was being cleaned out at the time of inspection and appeared to be in good condition. Tailings had partially filled the ditch after an overflow from the T2 drop box. The culvert sleeves at the Bootjack Creek crossing must also be cleaned out.

6.3.3 Reclaim Pipeline System

- The reclaim pipeline system continues to function satisfactorily and no changes are required.

6.3.4 Southeast Sediment Pond

- The pond level was at the normal operating level at the time of the inspection.

- The seeps observed in the northwest fill slope during previous inspections were once again present. All seepage was clear, indicating that no erosion of the fill was occurring.

- The embankment fill slopes are in good condition, with no new signs of instability.

- No new signs of instability were observed on the waste material and topsoil piles. The re-vegetation cover appears to be well established.

6.3.5 Polley Lake Pumping System

- The system performed well in 2000 and no modifications are needed thus far in 2001.

6.3.6 Millsite Sump

- The pond level was at the normal operating level during the inspection.

- A higher level gravity discharge to the tailings pipeline controls the pond level in the event of a power failure.

- All fill slopes were observed to be in good condition.

6.3.7 South Bootjack Dam

- The dam is in good condition and the spillway was observed to contain some vegetation but was clear of any obstructions.

- The pond level was low.

The above recommendations are currently being implemented by MPMC staff.

SECTION 7.0 - CERTIFICATION

This report was prepared and approved by the undersigned.

Prepared by: ______________________________

C. Wilson Muir, P.Eng.
Project Engineer

Approved by: ______________________________

Ken J. Brouwer, P.Eng.
President

TABLE 3.1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
TAILINGS PIEZOMETERS - MONITORING DATA

Printed: 25-Sep-2001

M:\11162\14\Report\2\[PIEZOTABLES_R0.xls]Tailings Piezos Comp R0

Revised: 25-Sep-2001

PIEZOMETER NO.	LOCATION	TIP EL. (m)	PRESSURE (m H_20)					COMMENTS
			Initial Reading		21-Apr-01 Reading		Change (m)	
			El. (m)	Head (m)	El. (m)	Head (m)		
A0-PE1-01	Plane A	938.54	937.86	-0.68	937.78	-0.76	-0.08	Installed in upstream cycloned sand fill.
A0-PE2-01	Plane A	928.03	928.87	0.84	938.96	10.93	10.09	Readings reflect rising pond level.
A0-PE2-02	Plane A	927.87	928.80	0.93	938.65	10.78	9.85	Readings reflect rising pond level.
B0-PE1-01	Plane B	939.40	938.46	-0.94	938.36	-1.04	-0.10	Installed in upstream cycloned sand fill.
B0-PE2-01	Plane B	927.30	928.08	0.78	940.12	12.82	12.04	Readings reflect rising pond level.
B0-PE2-02	Plane B	927.18	928.29	1.11	937.68	10.50	9.39	Readings reflect rising pond level.
C0-PE1-01	Plane C	938.00	937.40	-0.60	937.41	-0.59	0.01	Installed in upstream cycloned sand fill, Feb 25, 2000.
C0-PE2-01	Plane C	927.80	928.44	0.64	-	-	-	No longer functioning
C0-PE2-02	Plane C	927.48	928.64	1.16	-	-	-	No longer functioning

Knight Piésold CONSULTING

TABLE 3.2

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
EMBANKMENT FOUNDATION PIEZOMETERS - MONITORING DATA

M:\11162\14\Report\2\[PIEZOTABLES_R0.xls]Fdn Piezos comp R0

Printed: 25-Sep-2001
Revised: 25-Sep-2001

PIEZOMETER NO.	LOCATION	TIP EL. (m)	GROUND EL. (m)	PRESSURE (m H_2O)						COMMENTS
				Initial Reading		21-Apr-01 Reading		Change (m)	Artesian (m)	
				El. (m)	Head (m)	El. (m)	Head (m)			
A2-PE1-03	Plane A	909.34	910.8	912.81	3.47	911.02	1.68	-1.79	0.22	Artesian
A2-PE2-01	Plane A	903.68	912.67	913.19	9.51	915.73	12.05	2.54	3.06	Artesian since installation, gradually increasing.
A2-PE2-02	Plane A	909.77	912.67	911.72	1.95	912.01	1.83	0.29	-	Not artesian, minor fluctuations.
A2-PE2-06	Plane A	898.01	912.91	915.22	17.21	915.32	-6.55	0.10	2.41	Artesian, minor fluctuations
A2-PE2-07	Plane A	902.81	912.91	915.14	12.33	915.56	-6.31	0.42	2.65	Artesian, minor fluctuations
A2-PE2-08	Plane A	907.56	913.36	913.27	5.71	913.37	5.81	0.10	0.01	Near Artesian since installation, minor fluctuations.
B2-PE1-03	Plane B	914.05	915.55	913.4	-0.65	914.83	0.78	1.43	-	Not artesian, minor fluctuations.
B2-PE2-01	Plane B	901.98	916.98	913.47	11.49	918.35	16.37	4.88	1.37	Artesian, not artesian at start, gradually increasing.
B2-PE2-02	Plane B	909.51	916.98	914.48	4.97	920.89	11.38	6.41	3.91	Artesian, not artesian at start, gradually increasing.
B2-PE2-06	Plane B	914.59	916.89	915.99	1.40	916.05	1.46	0.06	-	Not artesian, minor fluctuations.
C2-PE1-03	Plane C	912.59	914.09	914.35	1.76	914.27	1.68	-0.08	0.18	Artesian
C2-PE2-01	Plane C	907.48	915.71	918.07	10.59	-	-	-	-	No longer functioning
C2-PE2-02	Plane C	910.53	915.71	916.09	5.56	917.28	6.75	1.19	1.57	Artesian since installation, fluctuating slightly.
C2-PE2-06	Plane C	906.84	915.99	916.66	9.82	916.18	9.34	-0.48	0.19	Artesian since start, slight fluctuations.
C2-PE2-07	Plane C	912.29	915.99	915.14	2.85	915.20	2.91	0.06	-	Not artesian, slight fluctuations.
C2-PE2-08	Plane C	914.03	915.99	913.45	-0.58	914.77	0.74	1.32	-	Not artesian, slight fluctuations.
D2-PE2-02	Plane D	927.32	930.92	928.68	1.36	929.25	1.93	-	-	Not artesian, slight fluctuations.
E2-PE2-01	Plane E	914.21	918.81	917.50	3.29	917.53	3.24	0.03	-	Not artesian, minor fluctuations.
E2-PE2-02	Plane E	909.66	918.81	917.57	7.91	917.39	7.90	-0.18	-	Not artesian, minor fluctuations.

TABLE 3.3

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
EMBANKMENT FILL PIEZOMETERS - MONITORING DATA

M:\11162\14\Report\2\[PIEZOTABLES_R0.xls]Fill Piezos comp R0

Printed: 25-Sep-2001
Revised: 25-Sep-2001

PIEZOMETER NO.	LOCATION	TIP EL. (m)	PRESSURE (m H_20)					COMMENTS
			Initial Reading		31-May-00 Reading		Change (m)	
			El. (m)	Head (m)	El. (m)	Head (m)		
A2-PE1-01	Plane A, Zone T	912.90	911.96	-0.94	911.97	-0.93	0.01	Negative (no pressure).
A2-PE1-02	Plane A, Glacial Till	938.47	938.90	0.43	940.30	1.83	1.40	Increase during Stage 3A fill placement, dissipating.
A2-PE2-03	Plane A, Glacial Till	919.43	919.66	0.23	929.83	10.40	10.17	Increase during Stage 3A fill placement, dissipating.
A2-PE2-04	Plane A, Glacial Till	926.07	925.67	-0.40	-	-	-	No longer functioning
A2-PE2-05	Plane A, Glacial Till	921.87	921.17	-0.70	922.06	0.19	0.89	Increasing very slowly.
B2-PE1-01	Plane B, Zone T	916.27	915.28	-0.99	915.54	-0.73	0.26	No excess pore pressure.
B2-PE1-02	Plane B, Glacial Till	939.40	940.84	1.44	943.93	4.53	3.09	Increase during Stage 3A fill placement, dissipating.
B2-PE2-03	Plane B, Glacial Till	921.00	920.41	-0.59	944.13	23.13	23.72	Increase during Stage 3A fill placement, dissipating.
B2-PE2-04	Plane B, Glacial Till	921.00	920.45	-0.55	929.32	8.32	8.87	Increase during Stage 3A fill placement, dissipating.
B2-PE2-05	Plane B, Glacial Till	921.66	922.78	1.12	922.85	1.19	0.07	Increase during Stage 3A fill placement, dissipating.
C2-PE1-01	Plane C, Zone T	915.02	914.08	-0.94	914.12	-0.90	0.04	No excess pore pressure.
C2-PE1-02	Plane C, Glacial Till	938.00	937.38	-0.62	940.04	2.04	2.66	Slight increase during Stage 3A fill placement, dissipating.
C2-PE2-03	Plane C, Glacial Till	921.00	925.50	4.50	921.84	0.84	-3.66	Slight increase during Stage 3A fill placement, dissipating.
C2-PE2-05	Plane C, Glacial Till	924.80	921.69	-3.11	-	-	-	No longer functioning
D2-PE1-01	Plane D, Zone T	930.42	929.46	-0.96	929.34	-1.08	-0.12	No excess pore pressure.
D2-PE2-01	Plane D, Glacial Till	931.00	931.00	0.00	932.48	1.48	1.48	Relatively constant, slight pore pressure.

TABLE 3.4

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
DRAIN PIEZOMETERS - MONITORING DATA

M:\11162\14\Report\2\[PIEZOTABLES_R0.xls]Drain Piezos comp R0

Printed: 25-Sep-2001
Revised: 25-Sep-2001

PIEZOMETER NO.	LOCATION	TIP EL. (m)	PRESSURE (m H_20)					COMMENTS
			Initial Reading		31-May-00 Reading		Change (m)	
			El. (m)	Head (m)	El. (m)	Head (m)		
A1-PE1-01	Foundation Drain FD-3.	913.00	912.22	-0.78	912.49	-0.51	0.27	Negative (no pressure), minor fluctuations.
A1-PE1-02	Foundation Drain FD-4.	912.10	911.42	-0.68	911.58	-0.52	0.16	Negative (no pressure), minor fluctuations.
A1-PE1-03	Chimney Drain.	917.20	916.65	-0.55	916.73	-0.47	0.08	Negative (no pressure), minor fluctuations.
A1-PE1-04	Upstream Toe Drain	936.25	936.74	0.49	936.54	0.29	-0.20	Negative (no pressure), minor fluctuations.
B1-PE1-01	Foundation Drain FD-1.	917.30	917.00	-0.30	916.69	-0.61	-0.31	Negative (no pressure), minor fluctuations.
B1-PE1-02	Foundation Drain FD-2.	915.95	915.14	-0.81	915.26	-0.69	0.12	Negative (no pressure), minor fluctuations.
B1-PE1-03	Chimney Drain.	918.70	918.09	-0.61	917.94	-0.76	-0.15	Negative (no pressure), minor fluctuations.
C1-PE1-01	Foundation Drain FD-1.	914.70	914.45	-0.25	914.22	-0.48	-0.23	Negative (no pressure), minor fluctuations.
C1-PE1-02	Chimney Drain.	916.60	916.02	-0.58	916.01	-0.59	-0.01	Negative (no pressure), minor fluctuations.
C1-PE1-04	Foundation Drain FD-5.	914.30	914.13	-0.17	913.93	-0.37	-0.20	Negative (no pressure), minor fluctuations.
D1-PE1-02	Outlet Drain OD-4.	928.76	928.24	-0.52	928.02	-0.74	-0.22	Negative (no pressure), minor fluctuations.

TABLE 3.5

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
TAILINGS STORAGE FACILITY

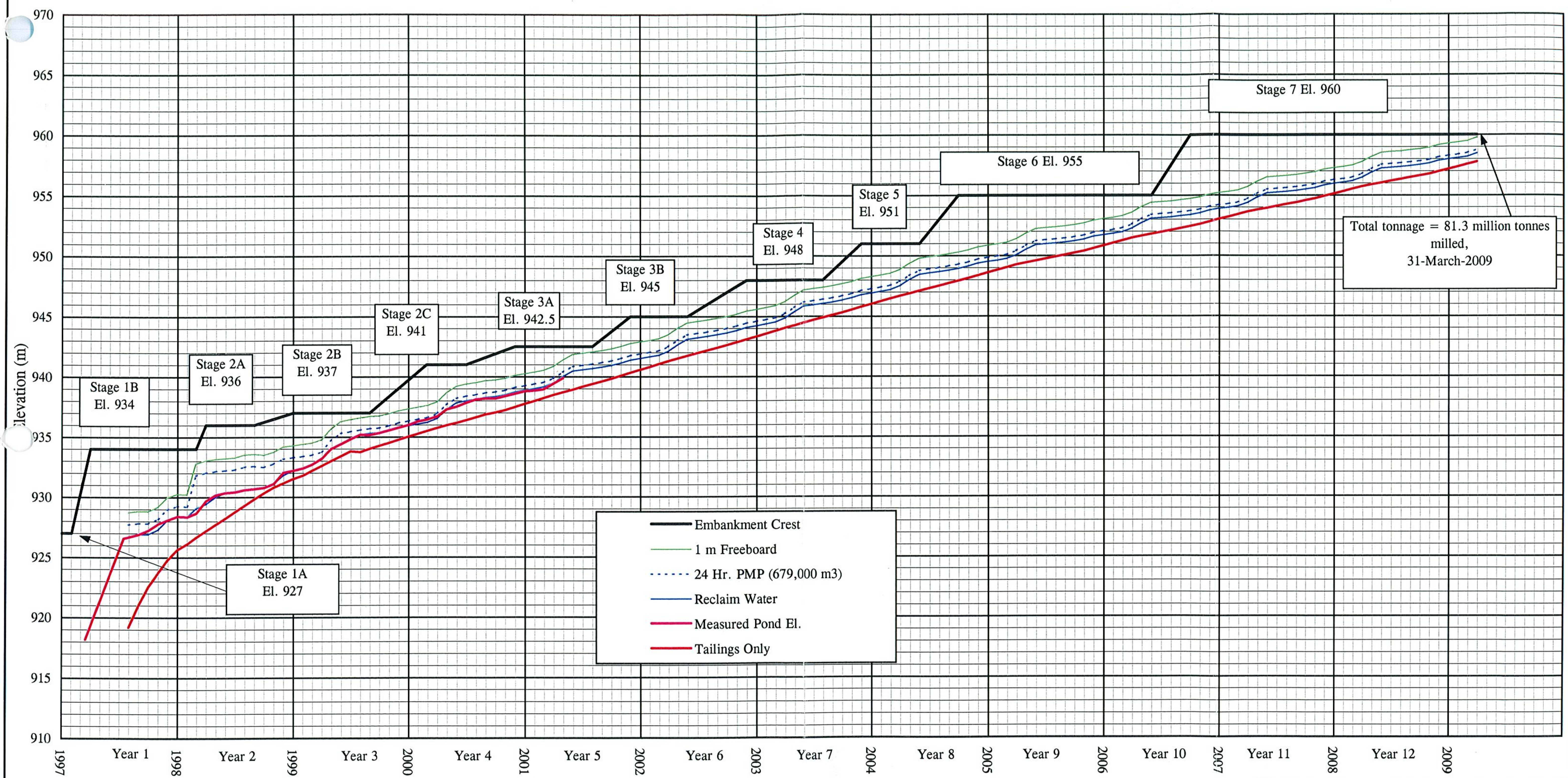
MAIN EMBANKMENT SEEPAGE COLLECTION POND - SUMMARY OF DRAIN FLOW DATA

M:\1\1627\14\Report\2\DrainsTables_R0.xls\FD-Mon_R0

Printed: 26-Sep-01
Revised: 26-Sep-01

SAMPLING DATE	FD-1			FD-2			FD-3			FD-4			FD-5			Total Flow Rate			Pond El (m)	GW96-9 (GW Well)
	Flow Rate			Flow Rate			Flow Rate			Flow Rate			Flow Rate							Elev. Above Top of Casing of well 9 (m)
Date	FD1(l/min)	(l/sec)	Comments	FD2(l/min)	(l/sec)	Comments	FD3(l/min)	(l/sec)	Comments	FD4(l/min)	(l/sec)	Comments	FD5(l/min)	(l/sec)	Comments	Tot(l/min)	Total Flow	Comments	Pond Elev.	
02-Jan-98	3.81	0.06	Clear	0.74	0.01	Clear	16.30	0.27	Clear	1.73	0.03	Clear				22.58	0.38	pig out, pumped down	928.10	Frozen
14-Jan-98	3.85	0.06	Clear	0.80	0.01	Clear	16.57	0.28	Clear	1.77	0.03	Clear				22.99	0.38	pig out, needs pumping	928.25	Frozen
21-Jan-98	3.57	0.06	Clear	0.74	0.01	Clear	16.42	0.27	Clear	1.82	0.03	Clear				22.55	0.38	pig out, needs pumping	928.30	Frozen
08-Apr-98	3.84	0.06	Clear	0.67	0.01	Clear	15.54	0.26	Clear	1.52	0.03	Clear				21.57	0.36	pig out, pond pumped down	929.70	-
17-Apr-98	3.82	0.06	Clear	0.69	0.01	Clear	15.58	0.26	Clear	1.37	0.02	Clear	6.33	0.11	Clear	27.79	0.46	pig out, pond pumped down	929.85	-
25-May-98	3.82	0.06	Clear	0.69	0.01	Clear	15.58	0.26	Clear	1.37	0.02	Clear	6.33	0.11	Clear	27.79	0.46	pig out, pond pumped down	930.10	-
02-Jun-98	3.52	0.06	Clear	0.78	0.01	Clear	15.58	0.26	Clear	1.42	0.02	Clear	6.80	0.11	Clear	28.10	0.47	pig out, pond pumped down	930.36	-
10-Jun-98	3.83	0.06	Clear	0.79	0.01	Clear	14.60	0.24	Clear	1.44	0.02	Clear	7.51	0.13	Clear	28.17	0.47	pig out, pond pumped down	930.39	-
16-Jun-98	3.77	0.06	Clear	0.78	0.01	Clear	16.35	0.27	Clear	1.41	0.02	Clear	7.93	0.13	Clear	30.24	0.50	pig out, pond pumped down	930.42	-
03-Jul-98	3.89	0.06	Clear	0.76	0.01	Clear	16.14	0.27	Clear	2.37	0.04	Clear	12.53	0.21	Clear	35.69	0.59	FD-5 is spilling onto FD-4 providing higher values than normal	930.45	
07-Jul-98	3.71	0.06	Clear	0.72	0.01	Clear	16.03	0.27	Clear	2.22	0.04	Clear	9.66	0.16	Clear	32.34	0.54	negative value is below top of casing	930.50	-0.135
24-Jul-98	3.53	0.06	Clear	0.72	0.01	Clear	15.75	0.26	Clear	1.96	0.03	Clear	8.70	0.15	Clear	30.66	0.51	-	930.58	0.28
12-Aug-98	3.46	0.06	Clear	0.62	0.01	Clear	15.96	0.27	Clear	1.90	0.03	Clear	7.30	0.12	Clear	29.24	0.49	-	930.61	0.33
19-Aug-98	3.17	0.05	Clear	0.56	0.01	Clear	15.83	0.26	Clear	2.26	0.04	Clear	8.08	0.13	Clear	29.90	0.50	-	930.64	-
10-Sep-98	3.60	0.06	Clear	0.57	0.01	Clear	16.35	0.27	Clear	2.03	0.03	Clear	8.02	0.13	Clear	30.57	0.51	-	930.70	-
17-Sep-98	3.53	0.06	Clear	0.63	0.01	Clear	16.42	0.27	Clear	2.20	0.04	Clear	8.52	0.14	Clear	31.30	0.52	-	930.73	-
24-Sep-98	3.62	0.06	Clear	0.64	0.01	Clear	15.64	0.26	Clear	2.06	0.03	Clear	7.77	0.13	Clear	29.73	0.50	-	930.77	-
07-Oct-98	3.72	0.06	Clear	1.05	0.02	Clear	14.22	0.24	Clear	2.36	0.04	Clear	13.39	0.22	Clear	34.74	0.58	positive value is above top of casing	930.81	0.18
15-Oct-98	3.82	0.06	Clear	1.10	0.02	Clear	14.53	0.24	Clear	2.56	0.04	Clear	15.83	0.26	Clear	37.84	0.63	-	930.87	
21-Oct-98	3.94	0.07	Clear	1.12	0.02	Clear	15.35	0.26	Clear	2.95	0.05	Clear	18.46	0.31	Clear	41.82	0.70	-	930.95	
17-Nov-98																		Sump flooded,needs to be pumped		0.11
27-Nov-98	4.21	0.07	Clear	1.01	0.02	Clear	14.28	0.24	Clear	2.35	0.04	Clear	11.76	0.20	Clear	33.62	0.56		931.35	-0.03
02-Dec-98	4.35	0.07	Clear	0.92	0.02	Clear	14.16	0.24	Clear	2.37	0.04	Clear	11.46	0.19	Clear	33.26	0.55		931.97	-0.03
09-Dec-98	4.34	0.07	Clear	0.79	0.01	Clear	16.56	0.28	Clear	2.01	0.03	Clear	9.78	0.16	Clear	33.49	0.56		931.97	Frozen
16-Dec-98	4.33	0.07	Clear	0.97	0.02	Clear	13.92	0.23	Clear	2.83	0.05	Clear	19.32	0.32	Clear	41.37	0.69		931.97	Frozen
22-Dec-98																			931.99	Frozen
11-May-00																			937.40	
18-Jul-00	3.60	0.06	Clear	0.60	0.01	Clear	16.80	0.28	Clear	1.20	0.02	Clear	24.00	0.40	Cloudy	46.20	0.77	FD-5 intercepting surface runoff	938.08	-0.05
25-Jul-00	4.20	0.07	Clear	1.44	0.02	Clear	16.80	0.28	Clear	1.50	0.03	Clear	39.00	0.65	Clear	62.94	1.05	Significant increase from FD-5	938.10	
24-Oct-00	21.00	0.35	Clear	67.20	1.12	Clear	17.40	0.29	Clear	2.40	0.04	Clear	75.60	1.26	Clear	183.60	3.06		938.25	Frozen
16-Nov-00	16.20	0.27	Clear	33.00	0.55	Clear	19.80	0.33	Clear	4.80	0.08	Clear	51.60	0.86	Clear	125.40	2.09	FD - 3 is surging (as usual)	938.52	Frozen
30-Nov-00	7.80	0.13	Clear	13.80	0.23	Clear	13.80	0.23	Clear	1.20	0.02	Clear	43.20	0.72	Clear	79.80	1.33	Pond level has been below drains since Oct 24/00	938.56	Frozen
07-Dec-00	6.60	0.11	Clear	12.60	0.21	Clear	14.40	0.24	Clear	1.20	0.02	Clear	44.40	0.74	Clear	79.20	1.32		938.60	Frozen
12-Dec-00	6.00	0.10	Clear	10.80	0.18	Clear	15.60	0.26	Clear	1.80	0.03	Clear	40.20	0.67	Clear	74.40	1.24		938.62	Frozen
10-Jan-01	6.60	0.11	Clear	9.60	0.16	Clear	14.40	0.24	Clear	1.08	0.02	Clear	50.40	0.84	Clear	82.08	1.37	Drains were submerged for the last 3 to 4 weeks	938.76	Frozen
19-Jan-01	5.88	0.10	Clear	9.00	0.15	Clear	13.20	0.22	Clear	1.14	0.02	Clear	44.40	0.74	Clear	73.62	1.23		938.80	Frozen
01-Feb-01	5.76	0.10	Clear	8.46	0.14	Clear	13.68	0.23	Clear	1.08	0.02	Clear	47.70	0.80	Clear	76.68	1.28		938.87	Frozen
20-Feb-01	5.91	0.10	Clear	8.88	0.15	Clear	13.86	0.23	Clear	1.05	0.02	Clear	33.31	0.56	Clear	63.01	1.05		938.95	Frozen
22-Mar-01	10.74	0.18	Clear	62.22	1.04	Clear	18.30	0.31	Clear	5.64	0.09	Clear	84.00	1.40	Clear	180.90	3.02	Flows definitely up. Lots of runnof during March	939.25	Frozen
29-Mar-01	9.00	0.15	Clear	77.40	1.29	Clear	17.88	0.30	Clear	4.44	0.07	Clear	97.02	1.62	Clear	205.74	3.43		939.44	Frozen
24-Apr-01	8.34	0.14	Clear	43.80	0.73	Clear	16.20	0.27	Clear	3.57	0.06	Clear	111.00	1.85	Clear	182.91	3.05		939.95	
27-Apr-01	7.80	0.13	Clear	34.62	0.58	Clear	15.54	0.26	Clear	2.76	0.05	Clear	74.70	1.25	Clear	135.42	2.26		940.05	
10-May-01	1.80	0.03	Partly	16.60	0.28	Partly	7.20	0.12	Partly	18.60	0.31	Partly	46.80	0.78	Partly	91.00	1.52	Stepho got her foot wet	940.18	
17-May-01	1.44	0.02	Clear	16.13	0.27	Clear	7.32	0.12	Clear	16.52	0.28	Clear	43.09	0.72	Clear	84.51	1.41			
01-Jun-01	5.79	0.10	Raining	11.62	0.19	Raining	14.58	0.24	Raining	1.29	0.02	Raining	39.95	0.67	Raining	73.23	1.22			

Note: The elevation for the top of the casing for Ground Water Well GW96-9 is approximately 916.78 m. The ground elevation is 916.18 m.



Notes:
1. Maximum Tailings Elevation is based on a total ore reserve of 81.3 million tonnes.
2. Production rate is 20,000 tpd.
3. Projected bulk tailings dry density is 1.36 t/m^3 for tailings reporting to the TSF after August 2000.
4. Supernatant pond volumes from updated MPMC water balance (August 2000 - base case) and vibrating wire piezometer data to April 2001

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

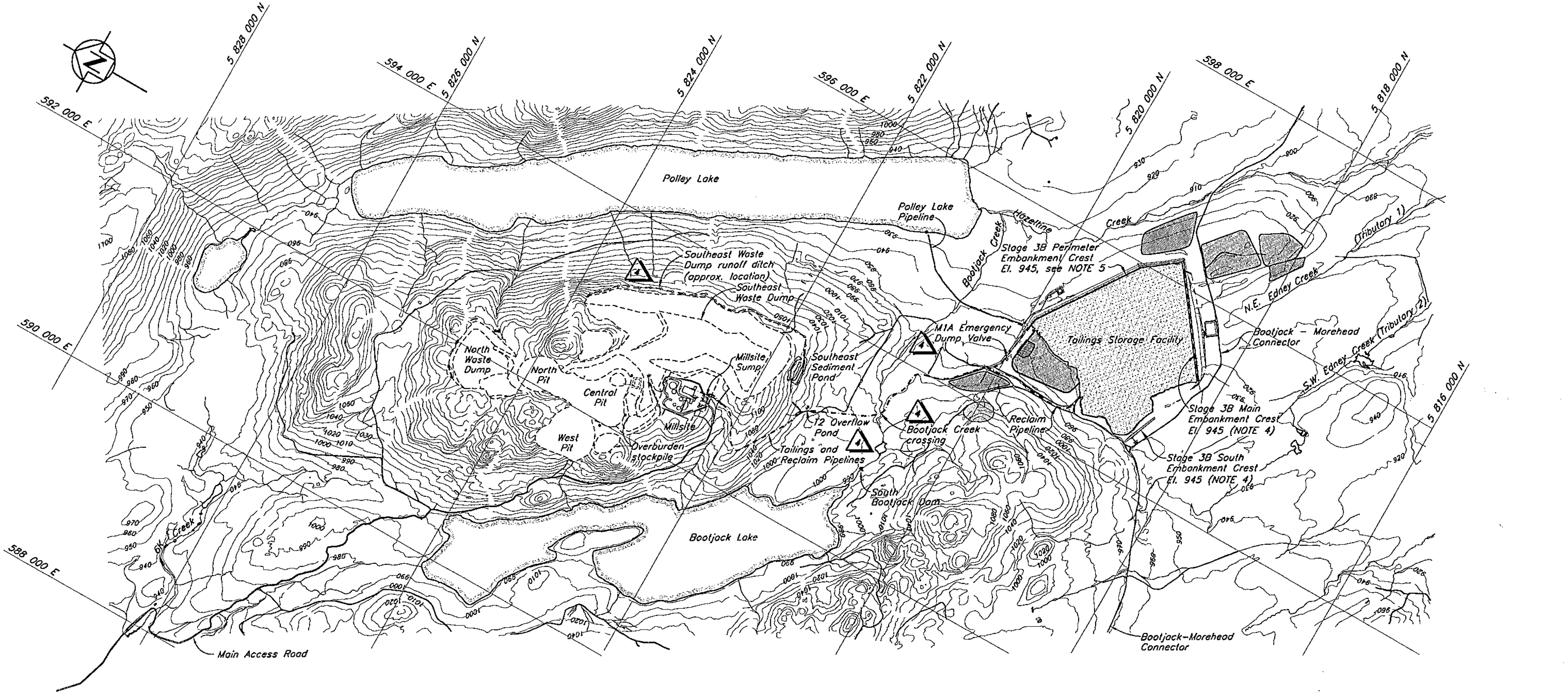
**TAILINGS STORAGE FACILITY
FILLING SCHEDULE AND STAGED CONSTRUCTION
ROCKFILL EMBANKMENT**

Knight Piésold CONSULTING

PROJECT NO.	REF. NO.	REV
11162/14	2	0

FIGURE 4.1

Rev 0 - Issued for Report



<u>NOTES</u>

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. Current size and location of potential and existing Borrow Areas and Topsoil Stockpiles are to be confirmed.
4. (△4) At the time of inspection, Stage 3A Main and South Embankments constructed to El. 942.5.
5. (△4) At the time of inspection, Stage 3A Perimeter Embankment constructed to El. 941.3 with Zone S and 942.5 with upstream Zone CS.

Scale 400 0 400 800 1200 1600 2000 m

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
4	14SEPT'01	ISSUED FOR 2000 & 2001 ANNUAL INSPECTON REPORT	CWM	TAM	[signature]	KJB
3	08MAY01	ISSUED FOR STAGE 3B TENDER	CWM	DSR	JRK	KJB
2	26JAN'01	STAGE 3B CREST EL. 945	JRK	TAM	JMTW	KJB
1	2JUN'00	ISSUED FOR CONSTRUCTION	MDB	TAM	ABW	KJB
0	14APR'00	ISSUED FOR TENDER	MDB	TAM	JRK	KJB

REVISIONS

DRG. NO.	DESCRIPTION

REFERENCE DRAWINGS

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

REVISIONS

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — C.W. MUIR

DESIGNED MDB | CHECKED JRK | DRAWN TAM | APPROVED KJB

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

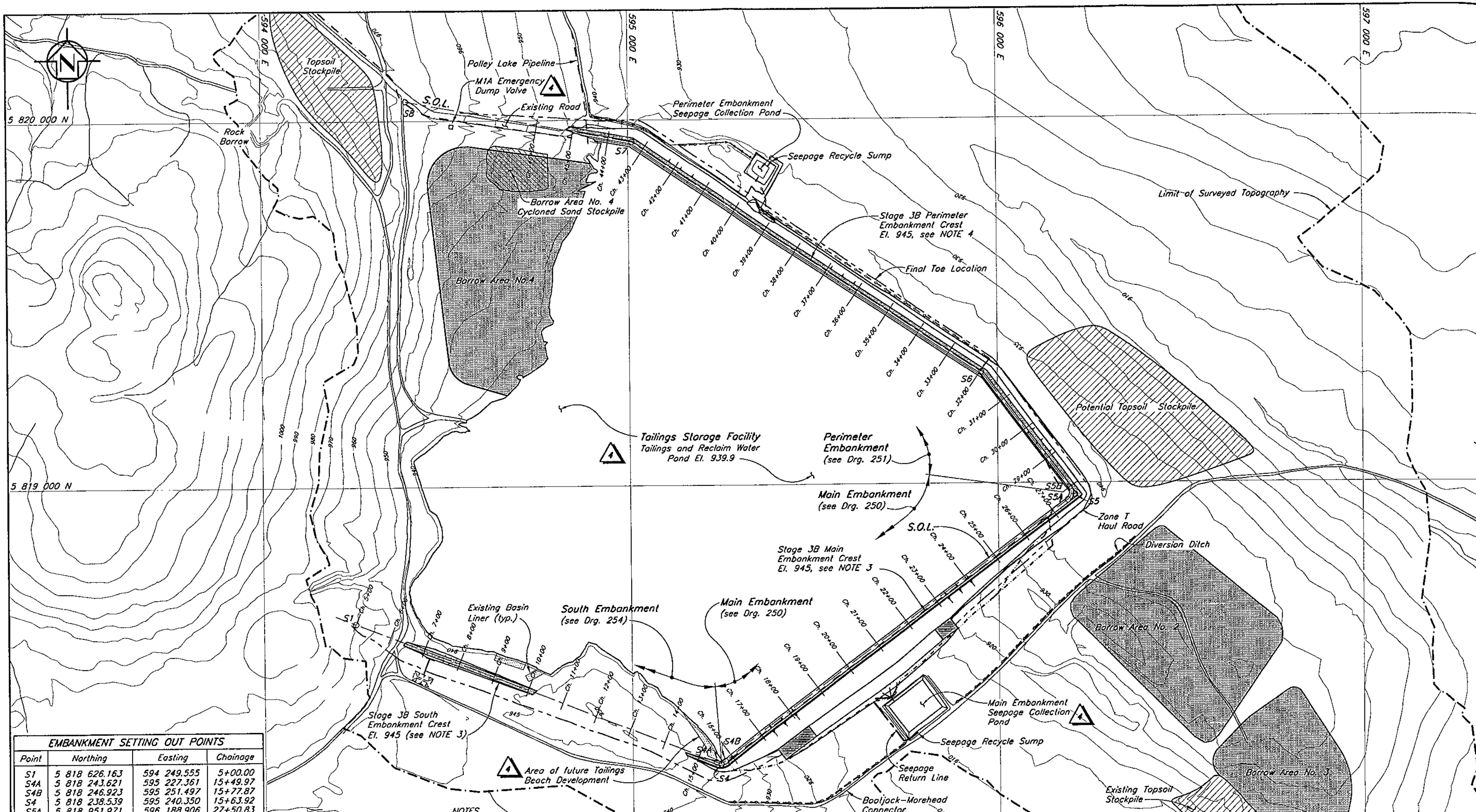
TAILINGS STORAGE FACILITY
STAGE 3 TAILINGS EMBANKMENT
OVERALL SITE PLAN

Knight Piésold CONSULTING

SCALE: AS SHOWN | REVISION: 4

DRAWING NO. 11162-13-100

XREF FILE: TOPO99_ST3_PLAN



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 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.
2. Current size and location of potential and existing Borrow Areas and Topsoil Stockpiles are to be confirmed.
3. At the time of inspection, Stage 3A Main and South Embankments constructed to El. 942.5.
4. At the time of inspection, Stage 3A Perimeter Embankment constructed to El. 941.3 with Zone S and 942.5 with upstream Zone CS.

REFERENCE DRAWINGS

DRG. NO.	DESCRIPTION
254	T.S.F. – STAGE 3 SOUTH EMBANKMENT – INSTRUMENTATION PLAN
251	T.S.F. – STAGE 3 PERIMETER EMBANKMENT – INSTRUMENTATION PLAN
250	T.S.F. – STAGE 3 MAIN EMBANKMENT – INSTRUMENTATION PLAN

REVISIONS

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

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
4	14SEPT'01	ISSUED FOR 2000 & 2001 ANNUAL INSPECTION REPORT	CWM	TAM		
3	08MAY'01	ISSUED FOR STAGE 3B TENDER	CWM	DSR	JRK	KJB
2	26JAN'01	STAGE 3B – CREST EL. 945	JRK	TAM	JMTW	KJB
1	2JUN'00	ISSUED FOR CONSTRUCTION	MDB	TAM	ABW	KJB
0	14APR'00	ISSUED FOR TENDER	MDB	NSD	JRK	KJB

PROFESSIONAL ENGINEER – PROVINCE OF BRITISH COLUMBIA – C.W. MUIR

DESIGNED	CHECKED
MDB	JRK
DRAWN	**APPROVED**
TAM	KJB

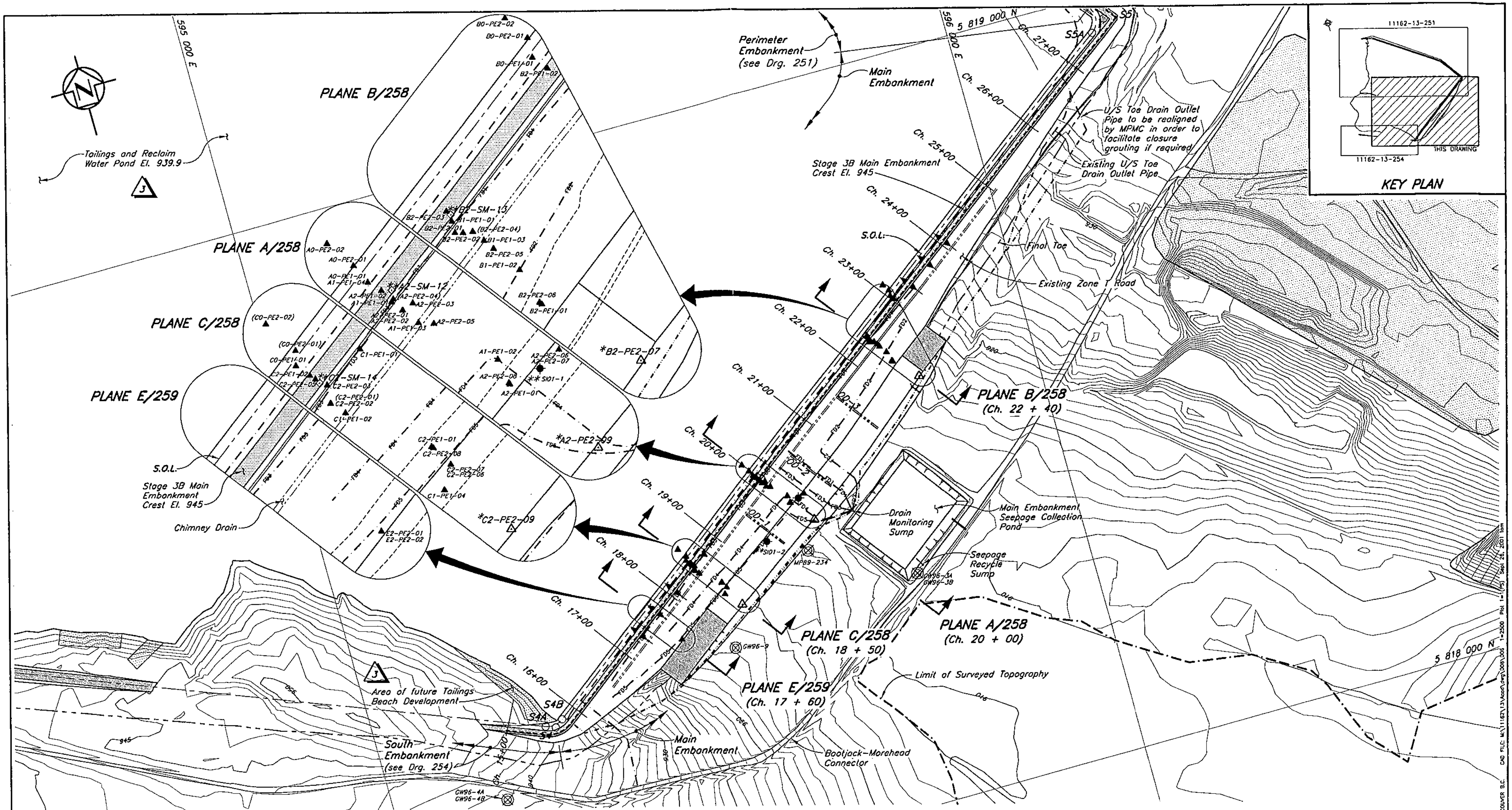
MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 3 TAILINGS EMBANKMENT
GENERAL ARRANGEMENT

Knight Piésold CONSULTING

SCALE: AS SHOWN
REVISION: 4
DRAWING NO. 11162-13-102



NOTE

1. See Drg. No. 11162-13-256 for Summary of Instrumentation Installations, Typical Details, General Notes and Legend.
2. Instrumentation with one asterisk indicates placement during Stage 3A construction. Instrumentation with 2 asterisks indicates placement during Stage 3B construction.

Scale 50 0 50 100 150 200 250 m

REFERENCE DRAWINGS

DRG. NO.	DESCRIPTION
259	TSF - STAGE 3 TAILINGS EMBANKMENT - INSTRUMENTATION - SECTIONS - SHEET 2 OF 2
258	TSF - STAGE 3 TAILINGS EMBANKMENT - INSTRUMENTATION - SECTIONS - SHEET 1 OF 2
256	TSF-STAGE 3 TAILINGS EMBANKMENT-INSTRUMENTATION-SUMMARY OF INSTALLATION AND TYPICAL DETAILS
254	TSF - STAGE 3 SOUTH EMBANKMENT - INSTRUMENTATION PLAN
251	TSF - STAGE 3 PERIMETER EMBANKMENT - INSTRUMENTATION PLAN

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
3	SEPT14'01	ISSUED FOR 2000 & 2001 ANNUAL INSPECTION REPORT	CWM	TAM		KJB
2	08MAY'01	ISSUED FOR STAGE 3B TENDER	CWM	DSR	JRK	KJB
1	26JAN'01	STAGE 3B - CREST EL. 945	JRK	TAM	JMTW	KJB
0	2JUN'00	ISSUED FOR CONSTRUCTION	JRK	TAM	ABW	KJB

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — C.W. MUIR

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

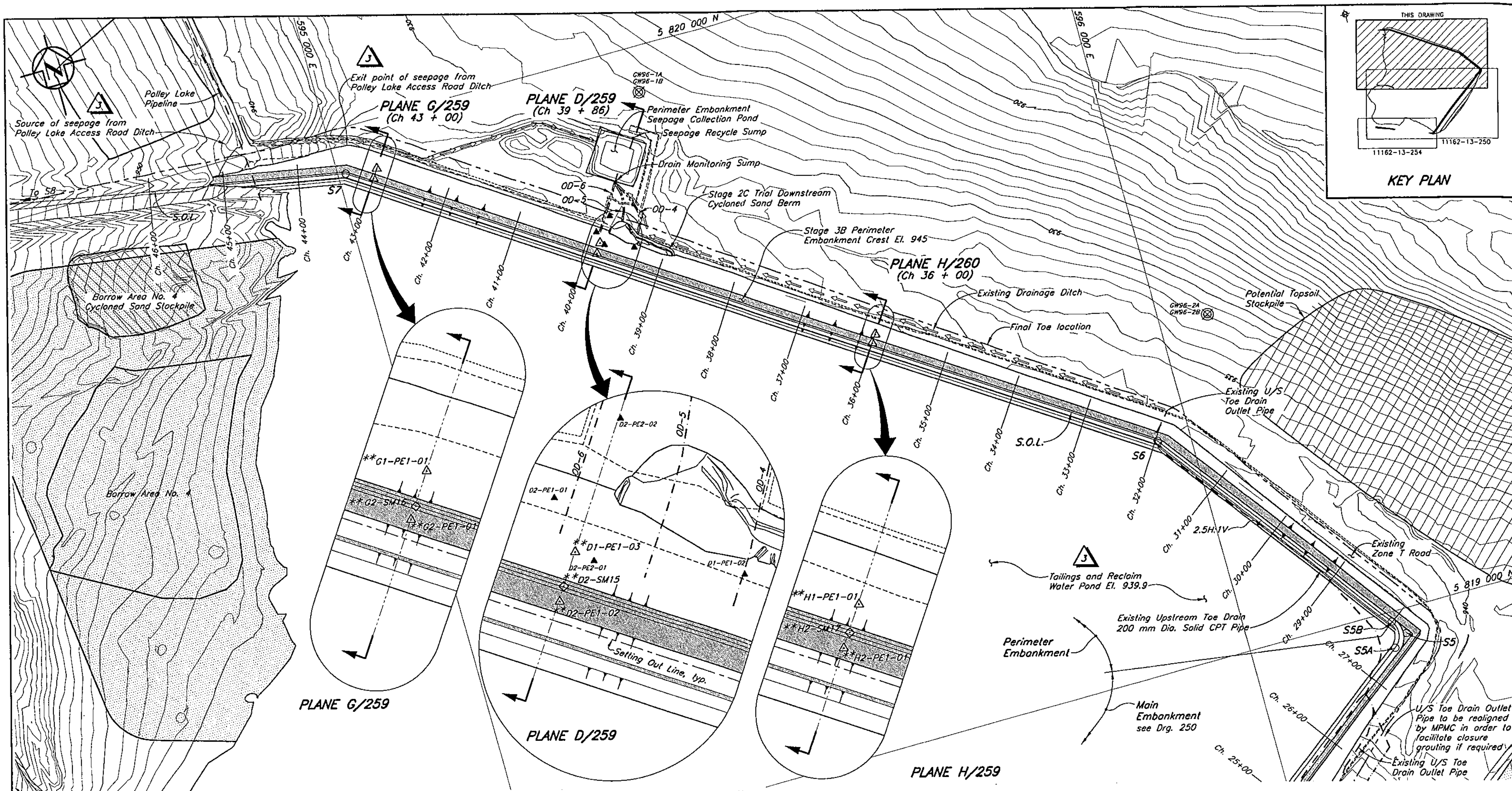
TAILINGS STORAGE FACILITY
STAGE 3 MAIN EMBANKMENT
INSTRUMENTATION
PLAN

DESIGNED	CHECKED	DRAWN	APPROVED
JRK	ABW	NSD	KJB

Knight Piésold CONSULTING

SCALE: AS SHOWN — REVISION: 3

DRAWING NO. 11162-13-250



LEGEND

- 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. See Drg. No. 11162-13-256 for Summary of Instrumentation Installations, Typical Details, General Notes and Legend.
4. Instrumentation with one asterisk indicates placement during Stage 3A construction. Instrumentation with 2 asterisks indicates placement during Stage 3B construction.

Scale 50 0 50 100 150 200 250 m

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — C.W. MUIR

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 3 PERIMETER EMBANKMENT
INSTRUMENTATION PLAN

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
3	14SEPT'01	ISSUED FOR 2000 & 2001 ANNUAL INSPECTION REPORT	CWM	TAM		KJB
2	08MAY'01	ISSUED FOR STAGE 3B TENDER	CWM	DSR	JRK	KJB
1	09MAR'01	STAGE 3B - CREST EL. 945	JRK	NSO	JMTW	KJB
0	20OCT'00	ISSUED FOR CONSTRUCTION	JRK	NSO	JMTW	KJB

REVISIONS

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

REVISIONS

DRG. NO.	DESCRIPTION
259	TSF - STAGE 3 TAILINGS EMBANKMENT - INSTRUMENTATION - SECTIONS - 2 OF 2
256	TSF - STAGE 3 TAILINGS EMBANKMENT - INSTRUMENTATION - SECTIONS - 1 OF 2
250	TSF - STAGE 3 MAIN EMBANKMENT - INSTRUMENTATION - PLAN

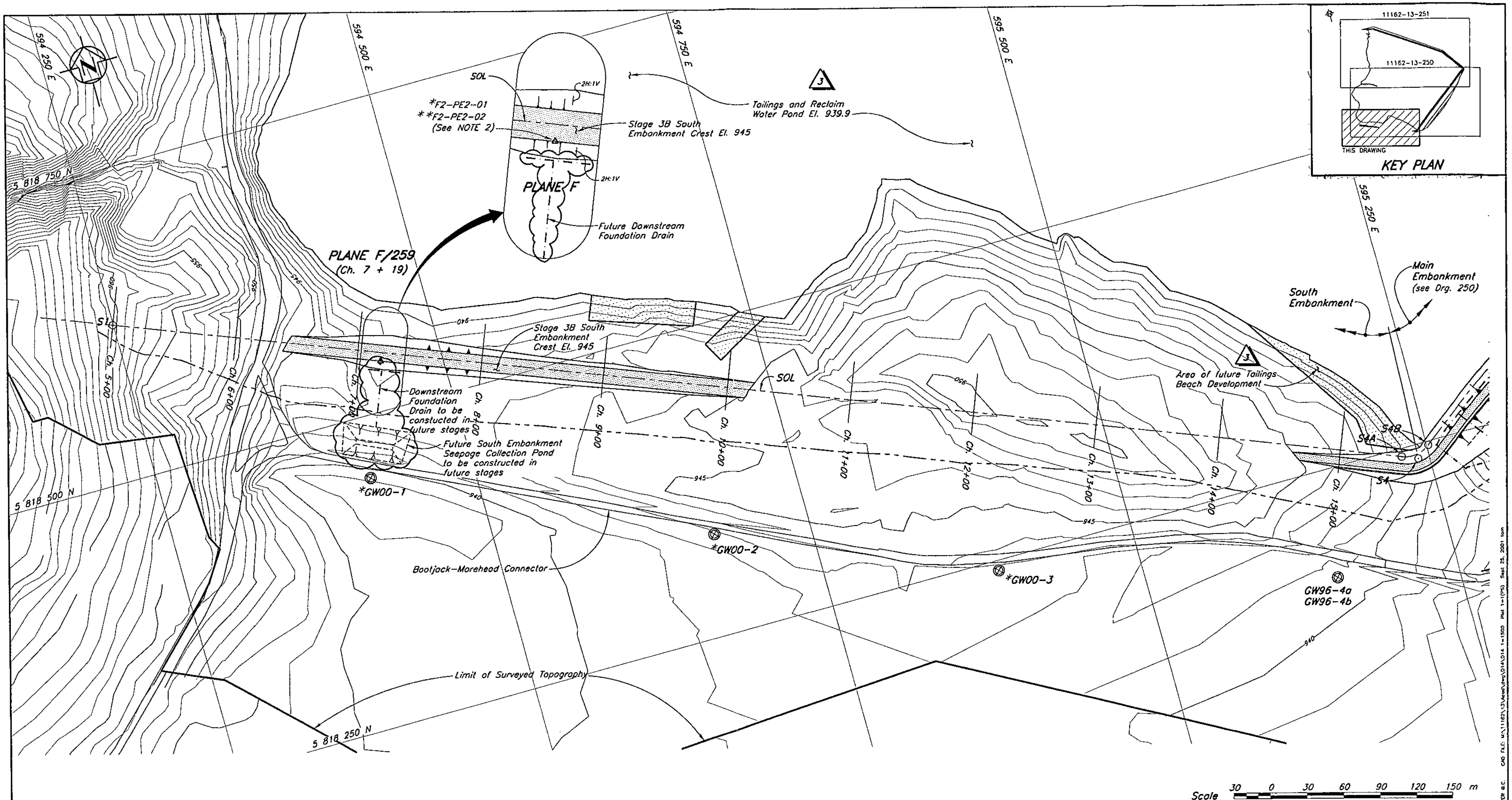
REFERENCE DRAWINGS

DESIGNED	CHECKED	DRAWN	APPROVED
JRK	ABW	NSO	KJB

Knight Piésold CONSULTING

SCALE: AS SHOWN
REVISION: 3
DRAWING NO. 11162-13-251

XREF FILE: TOPO99, STOCK99, STAGE3B_PLAN



NOTES

1. See Drg. No. 11162-13-256 for Summary of Instrumentation Installations, Typical Details, General Notes and Legend.
2. Instrumentation with one asterisk indicates placement during Stage 3A construction. Instrumentation with 2 asterisks indicates placement during Stage 3B construction.

REFERENCE DRAWINGS

DRG. NO.	DESCRIPTION
259	TSF - STAGE 3 TAILINGS EMBANKMENT - INSTRUMENTATION - SECTIONS - SHEET 2 OF 2
256	TSF - STAGE 3 TAILINGS EMBANKMENT - INSTRUMENTATION - SUMMARY OF INSTALLATION AND TYPICAL DETAILS
250	TSF - STAGE 3 MAIN EMBANKMENT - INSTRUMENTATION - PLAN

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
3	14SEPT'01	ISSUED FOR 2000 & 2001 ANNUAL INSPECTION REPORT	CWM	TAM		
2	08MAY'01	ISSUED FOR STAGE 3B TENDER	CWM	DSR	JRK	KJB
1	26JAN'01	STABE 3B - CREST EL. 945	JRK	TAM	JMTW	KJB
0	2JUN'00	ISSUED FOR CONSTRUCTION	JRK	TAM	ABW	KJB

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — C. W. MUIR

DESIGNED	CHECKED
JRK	ABW
DRAWN	**APPROVED**
NSO	KJB

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 3 SOUTH EMBANKMENT
INSTRUMENTATION PLAN

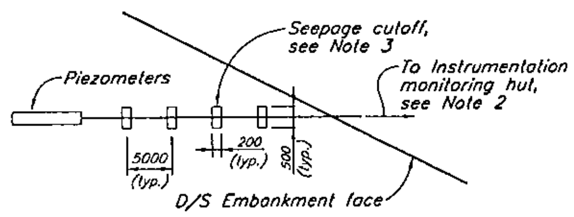
Knight Piésold CONSULTING

SCALE: AS SHOWN — REVISION: 3

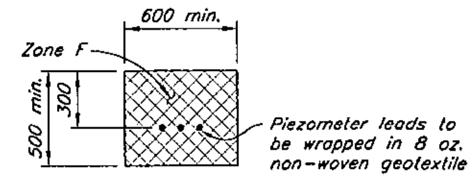
DRAWING NO. 11162-13-254

XREF FILE : TOPO99, STAGE3B_PLAN

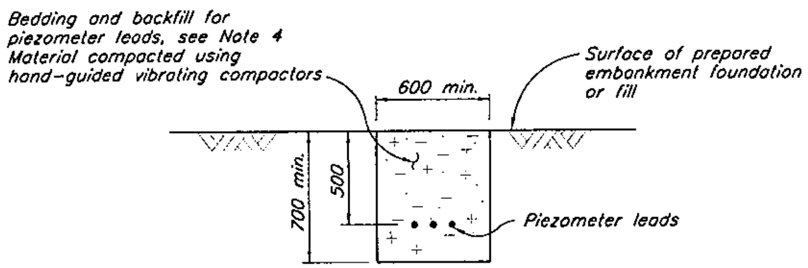
VANCOUVER B.C. — CAD FILE: M:\1162\13\Acad\Dwg\014\014 1=1500 Plot 1=1(PM) Sept 25, 2001 tom



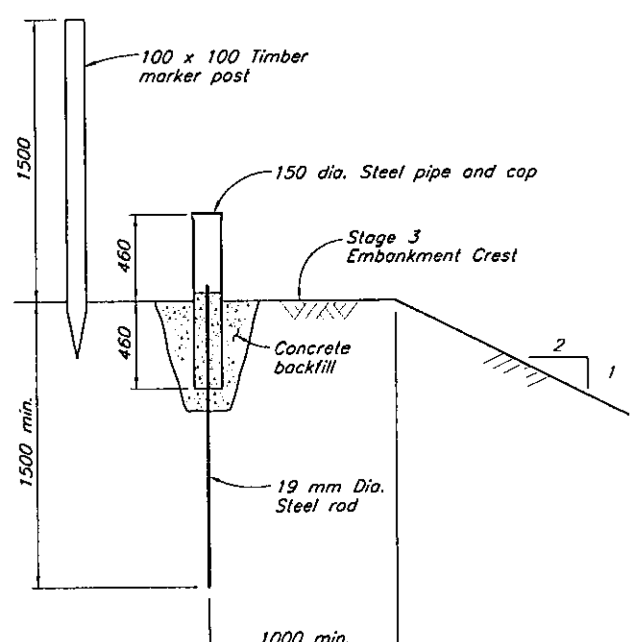
DETAIL A/258
TYPICAL INSTALLATION DETAIL OF SEEPAGE CUTOFF FOR PIEZOMETER LEADS IN GLACIAL TILL
NTS



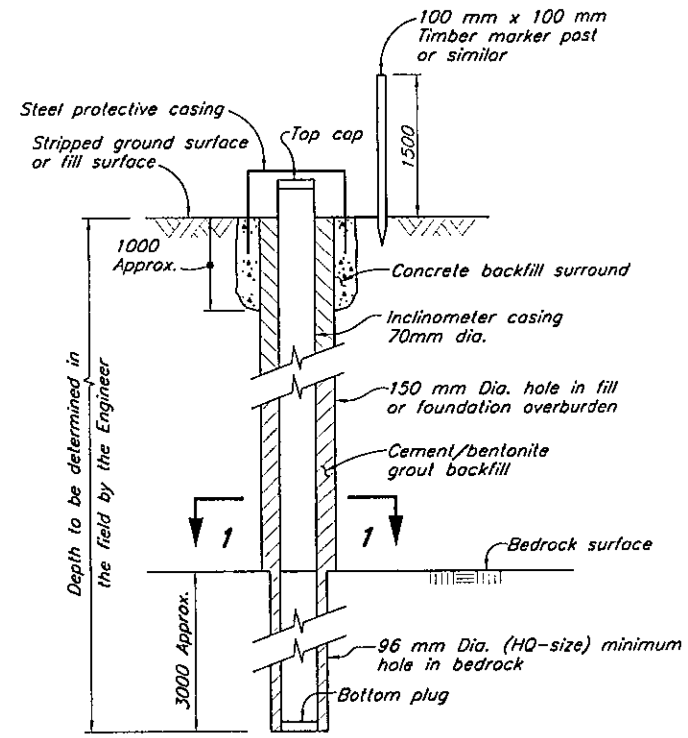
DETAIL B/258
TYPICAL INSTALLATION DETAIL FOR PIEZOMETER LEADS IN ZONE F



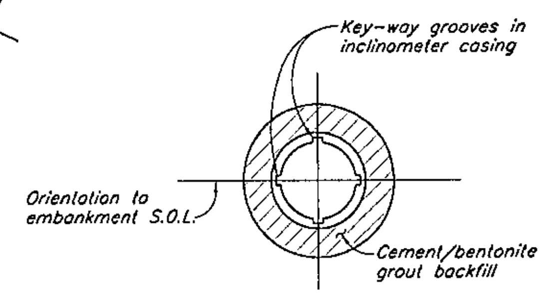
TYPICAL SECTION THROUGH PIEZOMETER LEAD TRENCH IN PREPARED EMBANKMENT FOUNDATION OR FILL



TYPICAL DETAIL OF SURFACE MOVEMENT MONUMENT



TYPICAL INCLINOMETER INSTALLATION IN BOREHOLE (3)
N.T.S.



SECTION 1 (3)
N.T.S.

SUMMARY OF INSTRUMENTATION INSTALLATIONS

PIEZOMETER ID	NORTHING	EASTING	ELEV.	DATE INSTALLED
A0-PE1-01	5 818 495.773	595 588.746	938.542	25/02/00
A0-PE2-01	5 818 502.850	595 585.398	928.03	09/03/98
A0-PE2-02	5 818 513.042	595 578.418	927.87	09/03/98
A1-PE1-01	5 818 486.650	595 595.060	912.99	27/08/96
A1-PE1-02	5 818 456.420	595 626.250	912.14	27/08/96
A1-PE1-03	5 818 476.822	595 602.380	917.17	22/10/96
A1-PE1-04	5 818 495.773	595 588.746	936.5	01/11/99
A2-PE1-01	5 818 446.550	595 628.010	912.89	26/08/98
A2-PE1-02	5 818 491.574	595 592.678	938.474	27/02/00
A2-PE2-01	5 818 482.710	595 598.140	903.7	25/07/96
A2-PE2-02	5 818 482.710	595 598.140	909.8	25/07/96
A2-PE2-03	5 818 484.196	595 602.354	919.43	12/02/97
(A2-PE2-04)	5 818 487.510	595 595.995	926.07	22/02/97
A2-PE2-05	5 818 475.061	595 607.560	921.87	22/02/97
A2-PE2-06	5 818 453.926	595 648.458	898.03	21/06/98
A2-PE2-07	5 818 453.926	595 648.458	902.83	21/06/98
A2-PE2-08	5 818 447.045	595 627.758	907.57	23/06/98
*A2-PE2-09			909.2	
A2-SM-09	NOT INSTALLED		942.5	
**A2-SM-12			945	
B0-PE1-01	5 818 681.542	595 831.874	939.05	20/02/00
B0-PE2-01	5 818 688.820	595 832.067	930.00	06/03/98
B0-PE2-02	5 818 697.980	595 826.160	927.18	06/03/98
B1-PE1-01	5 818 632.550	595 787.910	917.27	10/09/96
B1-PE1-02	5 818 609.040	595 806.770	915.95	10/09/96
B1-PE1-03	5 818 622.780	595 797.260	918.69	22/10/96
B2-PE1-01	5 818 594.940	595 811.260	916.272	26/08/98
B2-PE1-02	5 818 676.310	595 836.050	939.536	20/02/00
B2-PE2-01	5 818 628.270	595 787.880	902.00	25/07/96
B2-PE2-02	5 818 627.470	595 790.660	909.50	25/07/96
B2-PE2-03	5 818 636.530	595 786.970	921.00	22/10/96
(B2-PE2-04)	5 818 626.940	595 794.190	921.00	22/10/96
B2-PE2-05	5 818 619.014	595 799.804	921.70	14/03/97
B2-PE2-06	5 818 595.767	595 810.605	914.59	23/06/98
*B2-PE2-07			913.8	
B2-SM-10	NOT INSTALLED		942.5	
**B2-SM-13			945	
**SI01-1	5 818 450	595 640	918.5	
**SI01-2	5 818 405	595 583	919	

SUMMARY OF INSTRUMENTATION INSTALLATIONS (con't)

PIEZOMETER ID	NORTHING	EASTING	ELEV.	DATE INSTALLED
C0-PE1-01	5 818 408.969	595 469.750	939.267	26/02/00
(C0-PE2-01)	5 818 414.319	595 471.099	927.80	09/03/98
(C0-PE2-02)	5 818 426.495	595 463.101	927.48	09/03/98
C1-PE1-01	5 818 410.500	595 496.070	914.70	28/09/96
C1-PE1-02	5 818 387.690	595 482.400	916.60	22/10/96
C1-PE1-04	5 818 351.420	595 509.060	914.31	03/04/98
C2-PE1-01	5 818 367.670	595 508.900	915.016	26/08/98
C2-PE1-02	5 818 404.117	595 473.754	939.26	26/02/00
(C2-PE2-01)	5 818 392.410	595 478.240	907.50	25/07/96
C2-PE2-02	5 818 392.410	595 478.240	910.50	25/07/96
C2-PE2-03	5 818 399.106	595 478.824	920.97	12/02/97
C2-PE2-05	5 818 402.343	595 475.326	924.84	12/02/97
C2-PE2-06	5 818 359.734	595 513.663	906.84	18/06/98
C2-PE2-07	5 818 359.734	595 513.663	912.28	18/06/98
C2-PE2-08	5 818 367.087	595 509.351	914.03	19/06/98
*C2-PE2-09			913.4	
C2-SM-11	NOT INSTALLED		942.5	(3)
**C2-SM-14			945	
**D1-PE1-02	5 819 742.03	595 353.980	928.76	30/01/98
D1-PE1-03			934	(3)
(D2-PE1-01)	5 819 775.449	595 310.522	930	26/08/98
**D2-PE1-02			942	(3)
D2-PE2-01	5 819 756.360	595 316.210	931.00	15/12/96
D2-PE2-02	5 819 791.103	595 333.275	922	22/06/98
**D2-SM-15			945	
E2-PE2-01	5 818 307.454	595 435.983	908	17/06/98
E2-PE2-02	5 818 307.454	595 435.983	913	17/06/98
**F1-PE2-01			937	
**F2-PE2-02			942.5	
**G2-PE1-01			942	(3)
**G1-PE1-01		(3)	934	
**G2-SM-16			945	
**H1-PE1-01			934	(3)
**H2-PE1-01		(3)	942	
**H2-SM-17			945	

( ) Piezometer no longer functioning.
* Installed during Stage 3A construction.
(3) ** To be installed during Stage 3B construction.

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)

- A1-PE1-01 ▲ Previously installed Piezometer
- *A2-PE2-09 △ Stage 3A Piezometer
- (3) **D2-PE1-02 △ Stage 3B Piezometer
- **A2-SM-12 ◇ Stage 3B Embankment Survey Monument
- A2-SM-01 ◆ Current Embankment Survey Monument
- GW96-9 ⊕ Groundwater Monitoring Well
- (3) **SI01-1 ◆ Stage 3B Slope Inclinometer

NOTES

1. Dimensions are in millimeters unless otherwise noted.
2. Piezometer leads are to be extended as directed by the Engineer.
3. Seepage cutoffs placed at 5 m intervals with 10% bentonite added to fine grained till backfill.
4. Fine grained till backfill must have all particles exceeding 25 mm removed.

Scale 1000 500 0 1000 2000 mm

CAD FILE: M:\11162\13\Acad\Dwg\013\015.dwg 1=20 PLOT 1=1(PS) May 8, 2001 rod

VANCOUVER B.C.

ORG. NO.	DESCRIPTION
251	TSF - STAGE 3 PERIMETER EMBANKMENT - INSTRUMENTATION PLAN
259	TSF - STAGE 3 TAILINGS EMBANKMENT - INSTRUMENTATION SECTIONS - SHEET 2 OF 2
258	TSF - STAGE 3 TAILINGS EMBANKMENT - INSTRUMENTATION SECTIONS - SHEET 1 OF 2
254	TSF - STAGE 3 SOUTH EMBANKMENT - INSTRUMENTATION - PLAN
250	TSF - STAGE 3 MAIN EMBANKMENT - INSTRUMENTATION - PLAN

REFERENCE DRAWINGS

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

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
3	08MAY'01	ISSUED FOR STAGE 3B TENDER	CWM	DSR	JMC	KJB
2	26JAN'01	STAGE 3B - CREST ELEVATION 945	JRK	WAL	JMTW	KJB
1	20OCT'00	PERIMETER EMBANKMENT INSTRUMENTATION ADDED	JRK	NSD	JMTW	KJB
0	2JUN'00	ISSUED FOR CONSTRUCTION	JRK	TAM	JDC	KJB

REVISIONS

PROFESSIONAL ENGINEER – PROVINCE OF BRITISH COLUMBIA – C.W. MUIR

DESIGNED: JRK
CHECKED: JDC
DRAWN: DSR
APPROVED: KJB

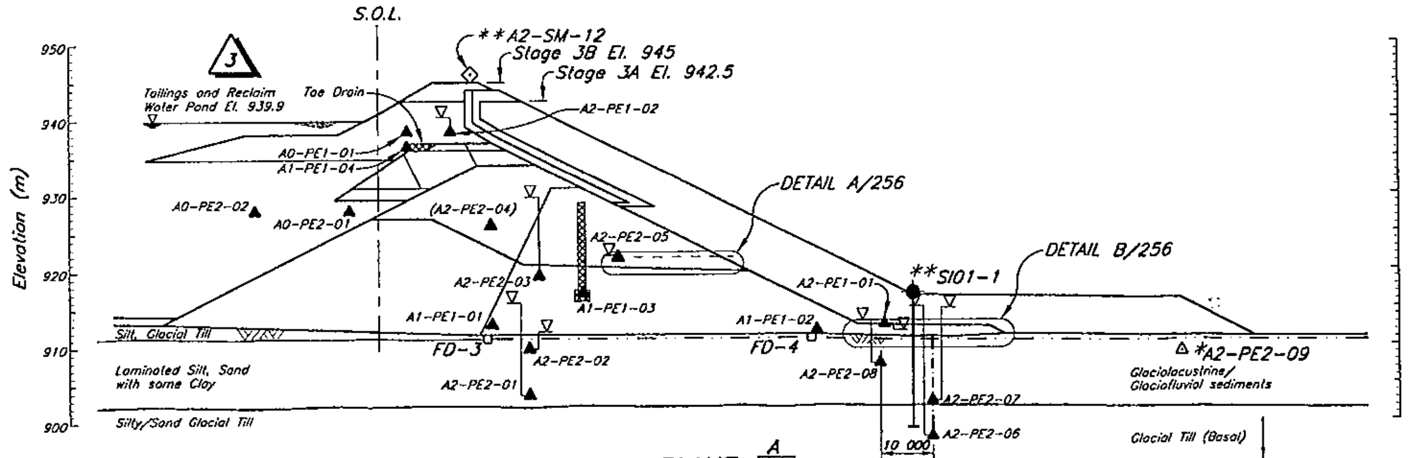
MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

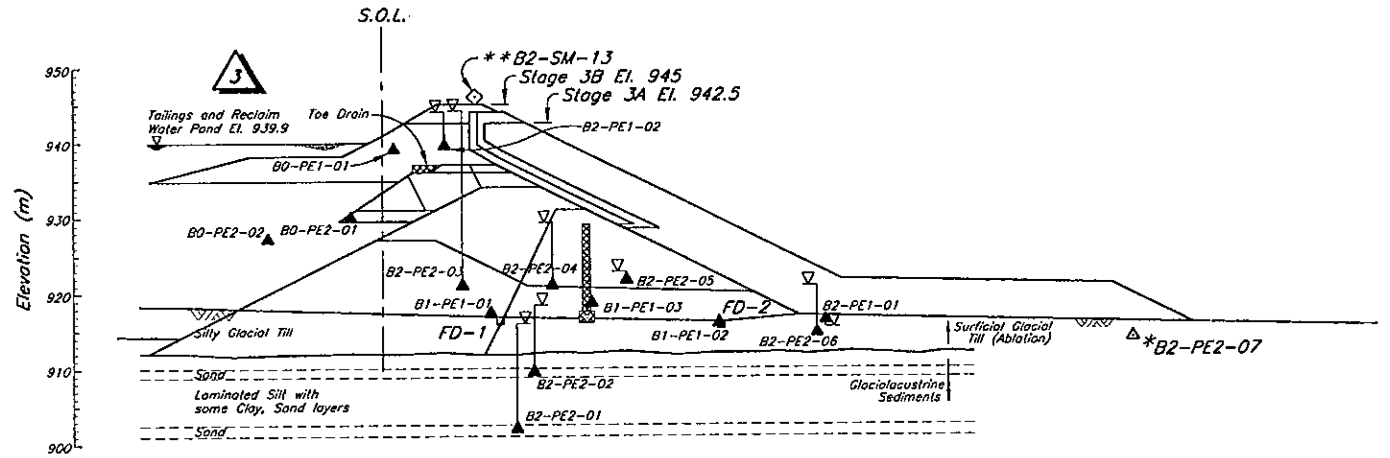
TAILINGS STORAGE FACILITY
STAGE 3 TAILINGS EMBANKMENT
INSTRUMENTATION
SUMMARY OF INSTALLATION & TYPICAL DETAILS

Knight Piésold CONSULTING

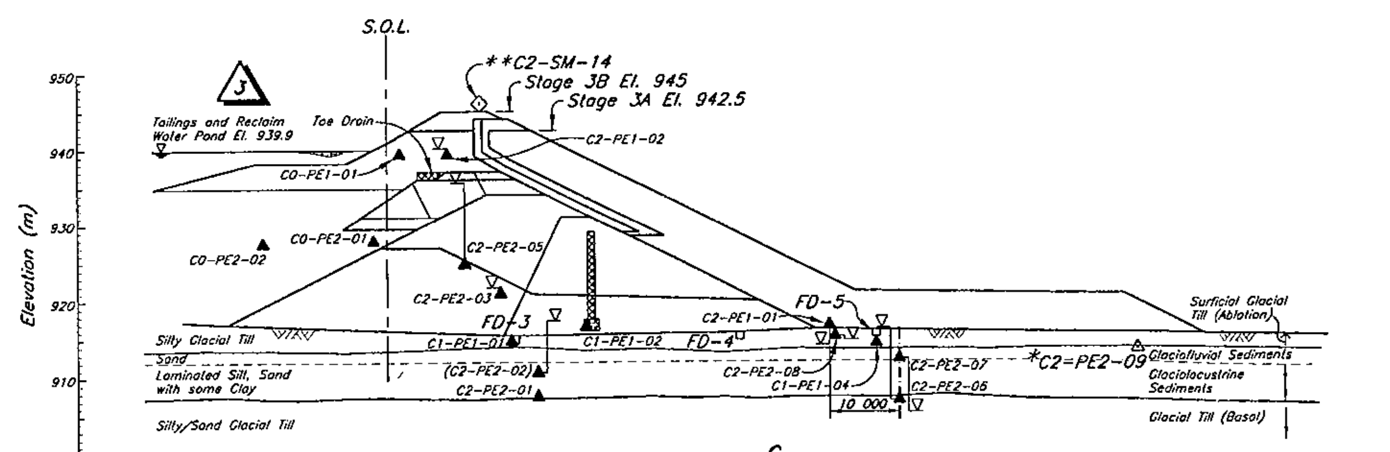
SCALE: AS SHOWN
REVISION: 3
DRAWING NO. 11162-13-256



PLANE $\frac{A}{250}$
CH. 20+00



PLANE $\frac{B}{250}$
CH. 22+40



PLANE $\frac{C}{250}$
CH. 18+50

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. *Piezometer leads extended as directed by the Engineer.*
3. *See Drg. No. 11162-13-256 for Summary of Instrumentation Installations, Typical Details, General Notes and Legend.*
4. *Instrumentation with one asterisk indicates placement during Stage 3A construction. Instrumentation with 2 asterisks indicates placement during Stage 3B construction.*

Scale 10 0 10 20 30 40 50 m

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA C.W. MUIR

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 3 TAILINGS EMBANKMENT
INSTRUMENTATION
SECTIONS – SHEET 1 OF 2

DRG. NO.	DESCRIPTION
259	TSF – STAGE 3 TAILINGS EMBANKMENT – INSTRUMENTATION – SECTIONS 2 OF 2
256	TSF – STAGE 3 TAILINGS EMBANKMENT – INSTRUMENTATION – SUMMARY OF INSTALLATION & TYPICAL DETAILS
250	TSF – STAGE 3 MAIN EMBANKMENT – INSTRUMENTATION – PLAN

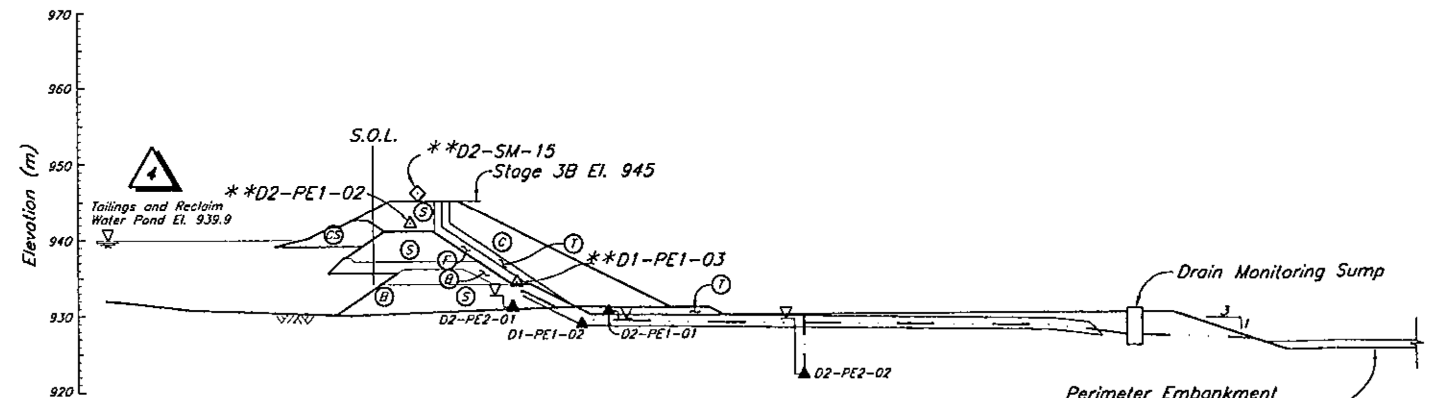
REFERENCE DRAWINGS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
3	14SEPT'01	ISSUED FOR 2000 & 2001 ANNUAL INSPECTION REPORT	CWM	TAM		KJB
2	08MAY'01	ISSUED FOR STAGE 3B TENDER	CWM	DSR	JRK	KJB
1	26JAN'01	STAGE 3B – CREST ELEVATION 945	JRK	AW	JMTW	KJB
0	2JUN'00	ISSUED FOR CONSTRUCTION	JRK	TAM	JDC	KJB

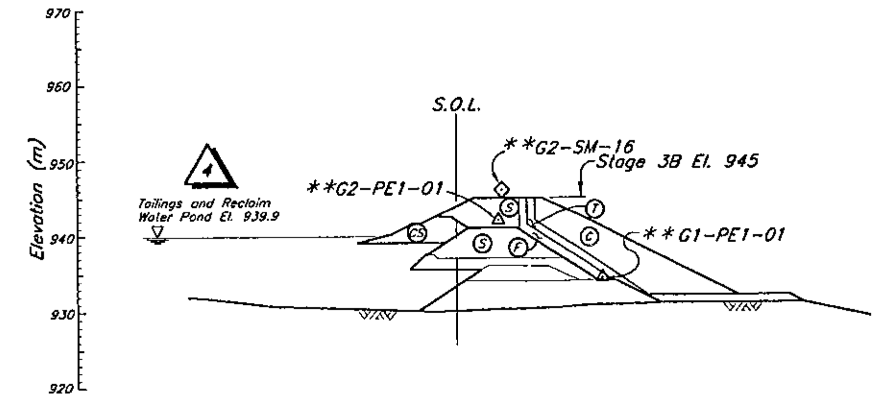
REVISIONS

DESIGNED	CHECKED	SCALE	REVISION
JRK	JDC	AS SHOWN	3
DRAWN	APPROVED	DRAWING NO.	
DSR	KJB	11162-13-258	

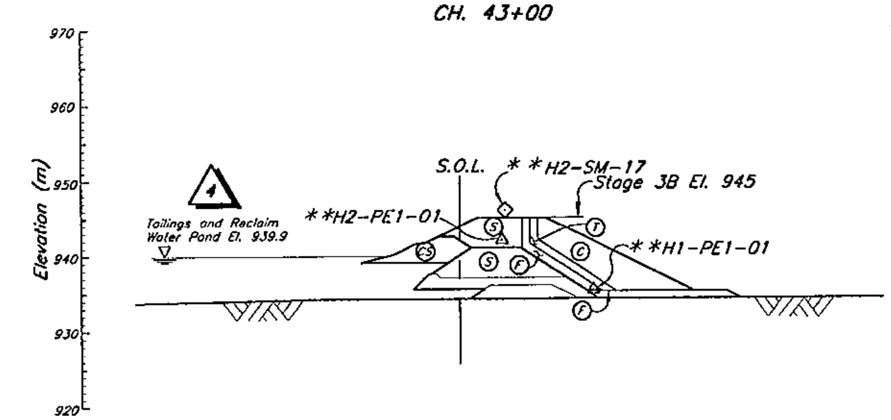
Knight Piésold CONSULTING



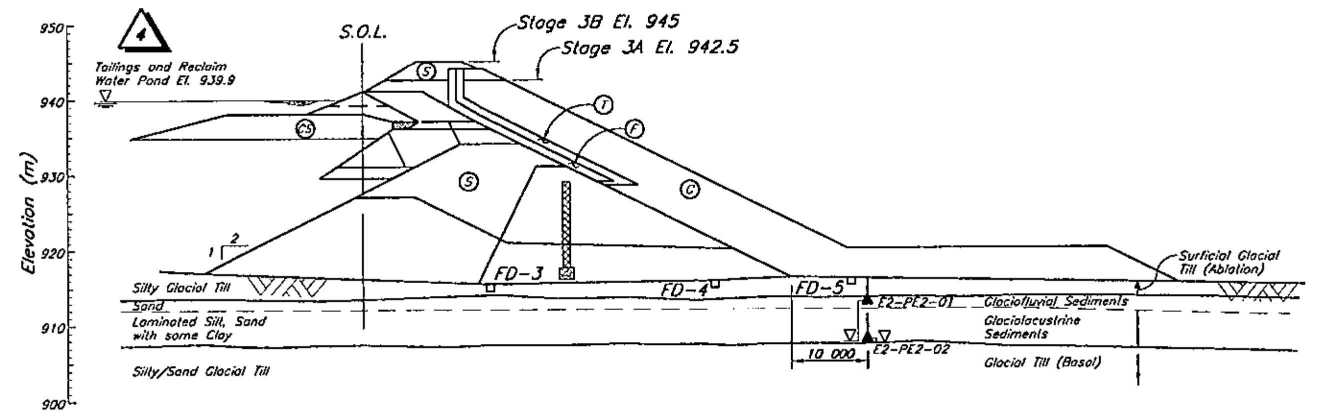
PLANE D/251
CH. 39+86



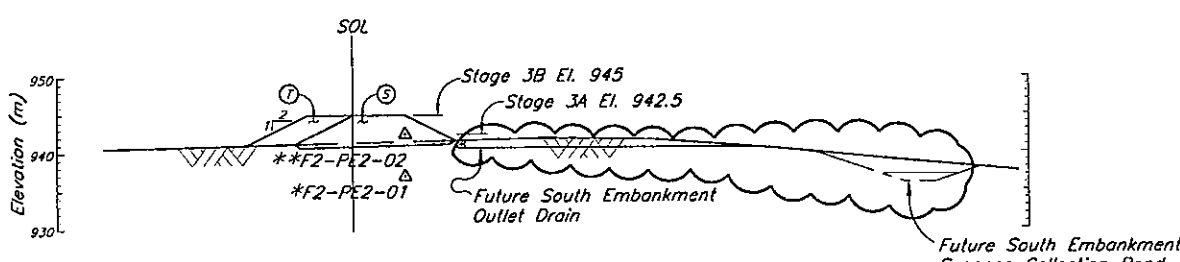
PLANE G/251
CH. 43+00



PLANE H/251
CH. 36+00



PLANE E/250
CH. 17+60



PLANE F/254
CH. 7+19

NOTE

1. See Drg. No. 11162-13-256 for Summary of Instrumentation Installations, Typical Details, General Notes and Legend.
2. Instrumentation with one asterisk indicates placement during Stage 3A construction. Instrumentation with 2 asterisks indicates placement during Stage 3B construction.

Scale 10 0 10 20 30 40 50 m

DRG. NO.	DESCRIPTION
256	TSF – STAGE 3 TAILINGS EMBANKMENT – INSTRUMENTATION SUMMARY OF INSTALLATION & TYPICAL DETAILS
254	TSF – STAGE 3 TAILINGS EMBANKMENT – SOUTH EMBANKMENT – INSTRUMENTATION PLAN
251	TSF – STAGE 3 PERIMETER EMBANKMENT – INSTRUMENTATION PLAN
250	TSF – STAGE 3 TAILINGS EMBANKMENT – MAIN EMBANKMENT – INSTRUMENTATION PLAN

REFERENCE DRAWINGS

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

REVISIONS

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
4	14SEPT'01	ISSUED FOR 2000 & 2001 ANNUAL INSPECTION REPORT	CWM	TAM		
3	08MAY'01	ISSUED FOR STAGE 3B TENDER	CWM	DSR	JRK	KJB
2	26JAN'01	STAGE 3B – CREST ELEVATION 945	JRK	AW	JMTW	KJB
1	20OCT'00	PEREMETER EMBANKMENT SECTIONS ADDED	JRK	NSD	JMTW	KJB
0	2JUN'00	ISSUED FOR CONSTRUCTION	JRK	TAM	ABW	KJB

REVISIONS

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
C.W. MUIR

DESIGNED	CHECKED
JRK	ABW
DRAWN	APPROVED
DSR	KJB

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

TAILINGS STORAGE FACILITY
STAGE 3 TAILINGS EMBANKMENT
INSTRUMENTATION
SECTIONS – SHEET 2 OF 2

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SCALE: AS SHOWN
REVISION: 4
DRAWING NO. 11162-13-259

XREF FILE:

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APPENDIX A

(REV 0)

2000 ANNUAL INSPECTION PHOTOGRAPHS

PHOTO 1: Southeast Sediment Pond – Looking East

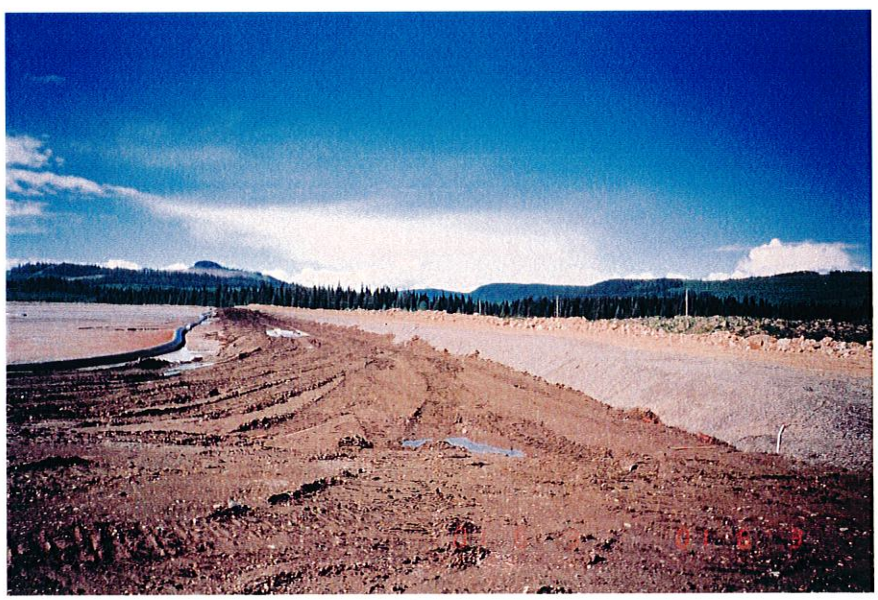

PHOTO 2 – Perimeter Embankment from Main Embankment – Looking North

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PHOTO 3: Main Embankment from Right Abutment – Looking East

PHOTO 4: Main Embankment Seepage Collection Pond from Main Embankment Crest- Looking South

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PHOTO 5: South Embankment from Right Abutment – Looking East

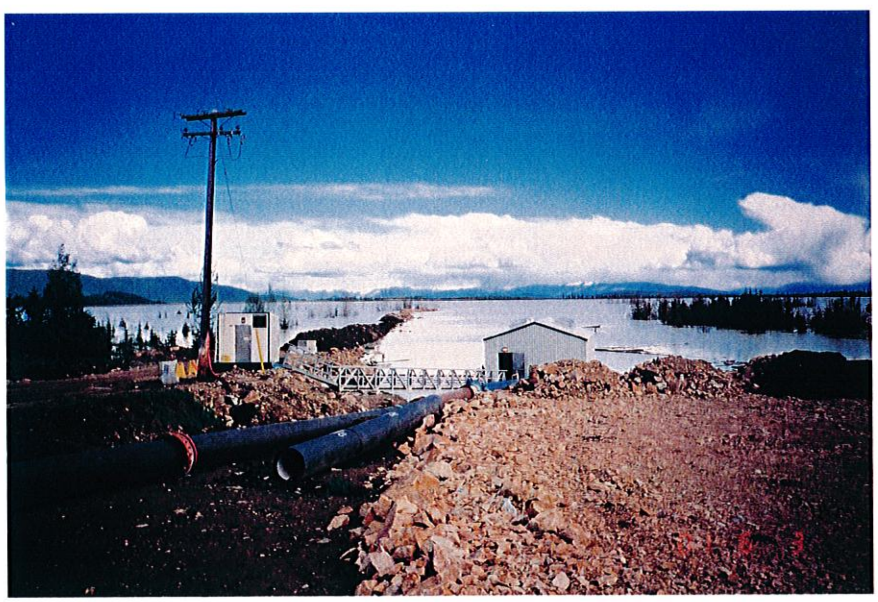

PHOTO 6: Reclaim Barge – Looking Southeast

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MOUNT POLLEY MINE

PHOTO 7: Reclaim Line and Tailings Impoundment – Looking East

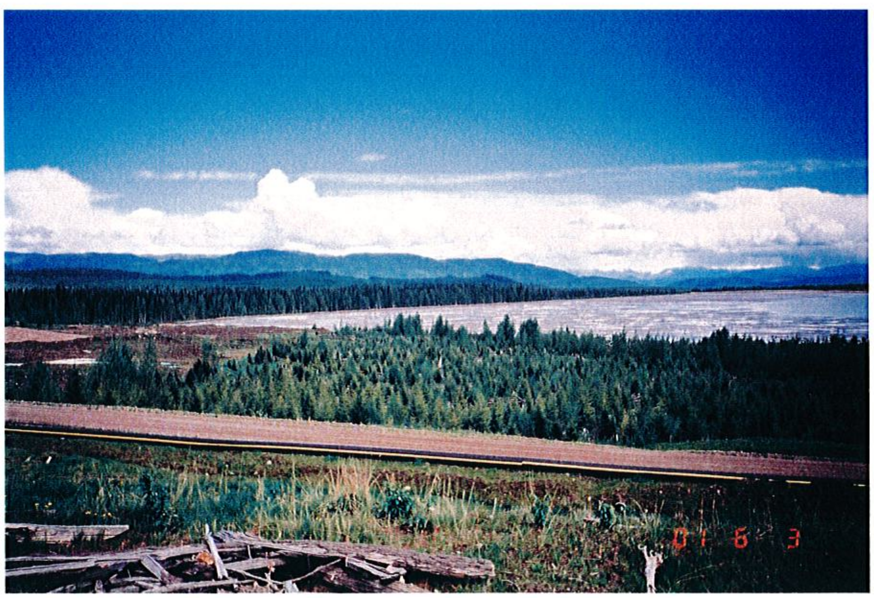

PHOTO 8: Perimeter Embankment Left Abutment and Reclaim Line – Looking East

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MOUNT POLLEY MINE

APPENDIX B

PIEZOMETER RECORDS

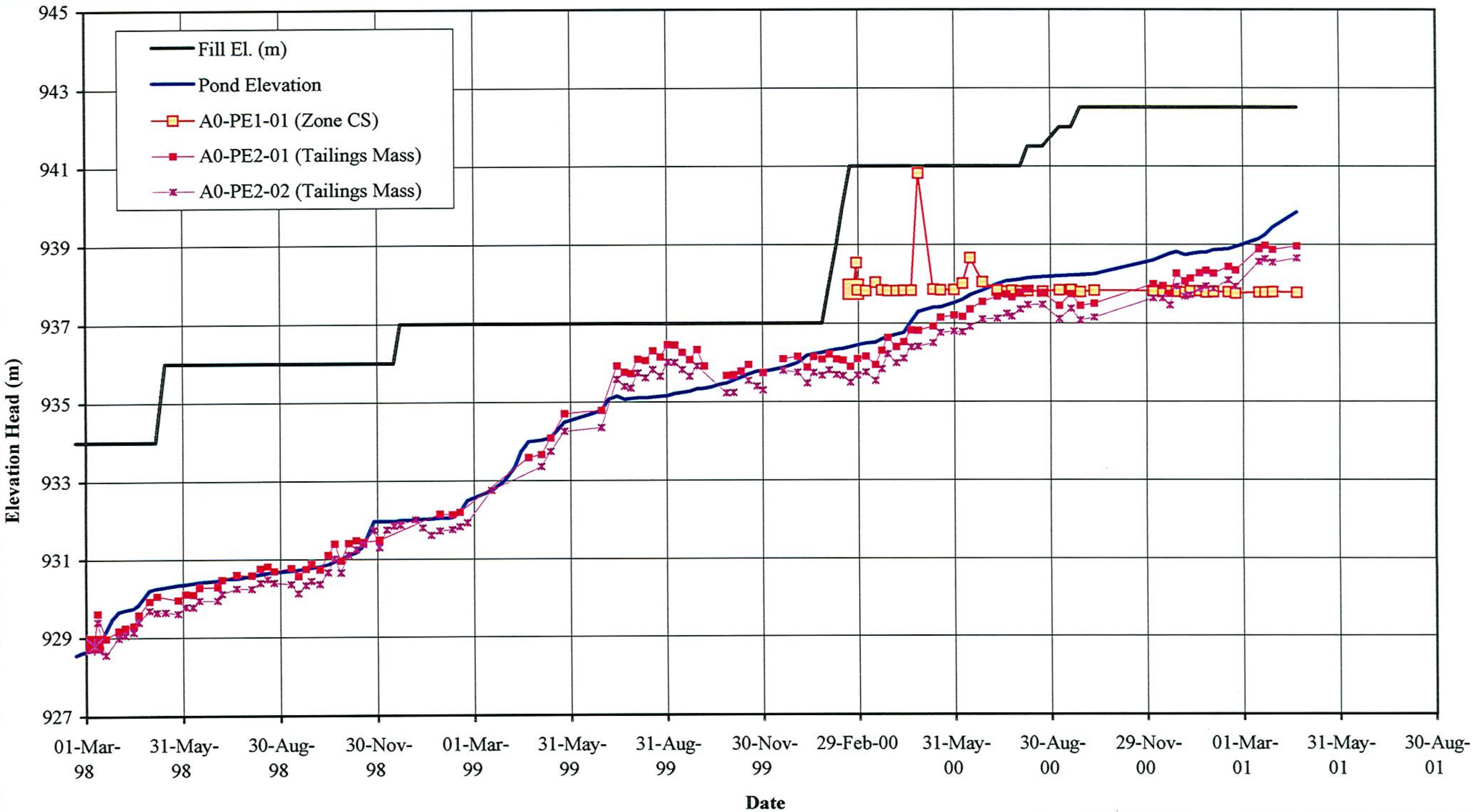
B1, Rev. 0	Tailings Piezometer Records
B2, Rev. 0	Embankment Foundation Piezometer Records
B3, Rev. 0	Embankment Fill Piezometer Records
B4, Rev. 0	Drain Piezometer Records

APPENDIX B1
(REV 0)

TAILINGS PIEZOMETER RECORDS

M:\11162\14\report\2\Plane A_r0.xls\Tailings Piezos

9/26/01

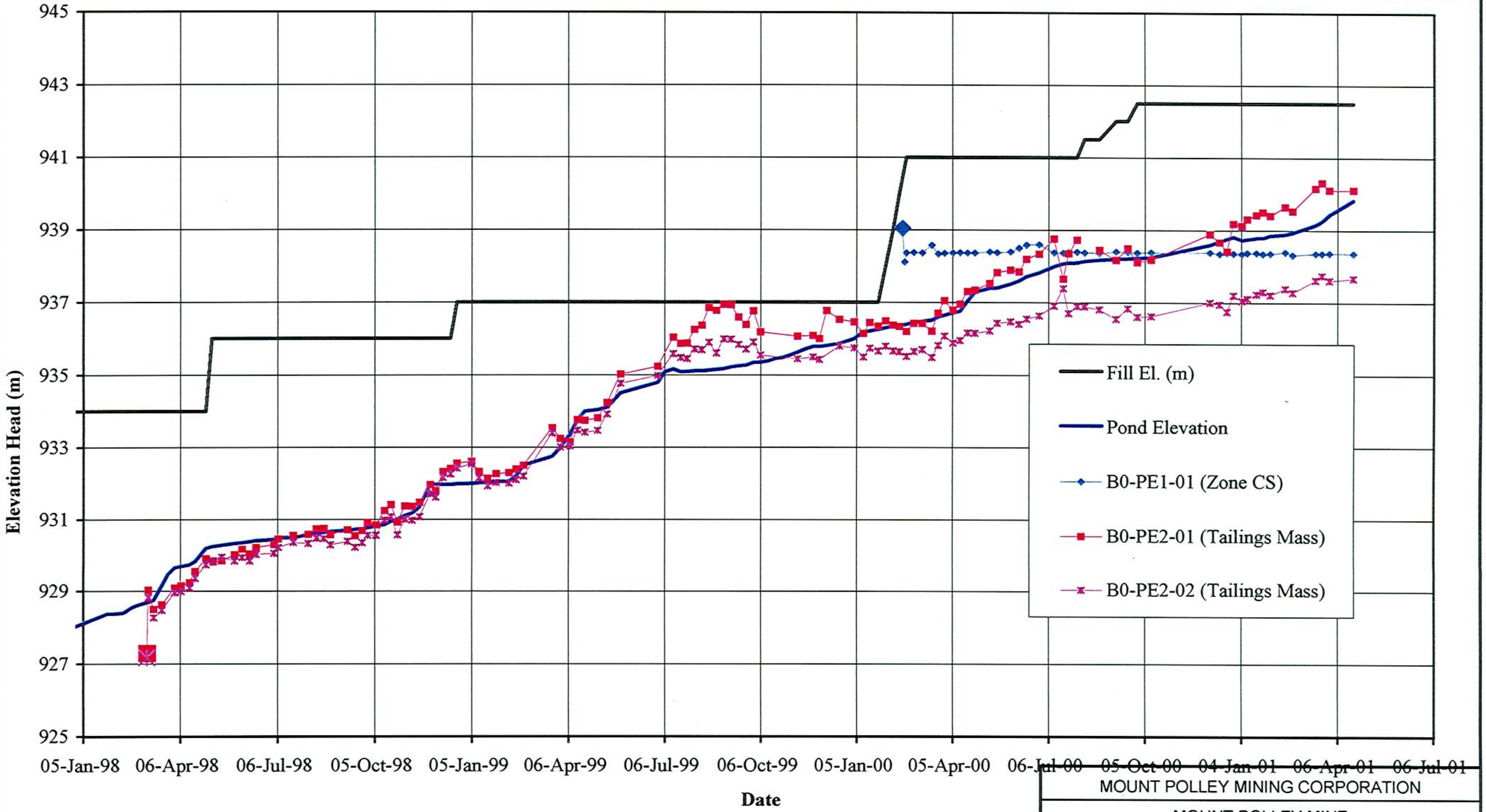


MOUNT POLLEY MINING CORPORATION			
MOUNT POLLEY MINE			
PLANE A TAILINGS PIEZOMETERS ELEVATION HEAD vs. TIME			
Knight Piésold CONSULTING	PROJECT NO. 11162/14	REF NO. 2	REV. 0
	FIGURE B1-1		

Rev 0 - Issued with Report on 2000 and 2001 Annual Inspection

M:\11162\14\report\2\Plane B_r0.xls\tails piezos

9/27/01



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MOUNT POLLEY MINE

PLANE B TAILINGS PIEZOMETERS
ELEVATION HEAD vs. TIME

Knight Piésold CONSULTING

PROJECT NO.	REF NO.	REV.
11162/14	2	0

FIGURE B1-2

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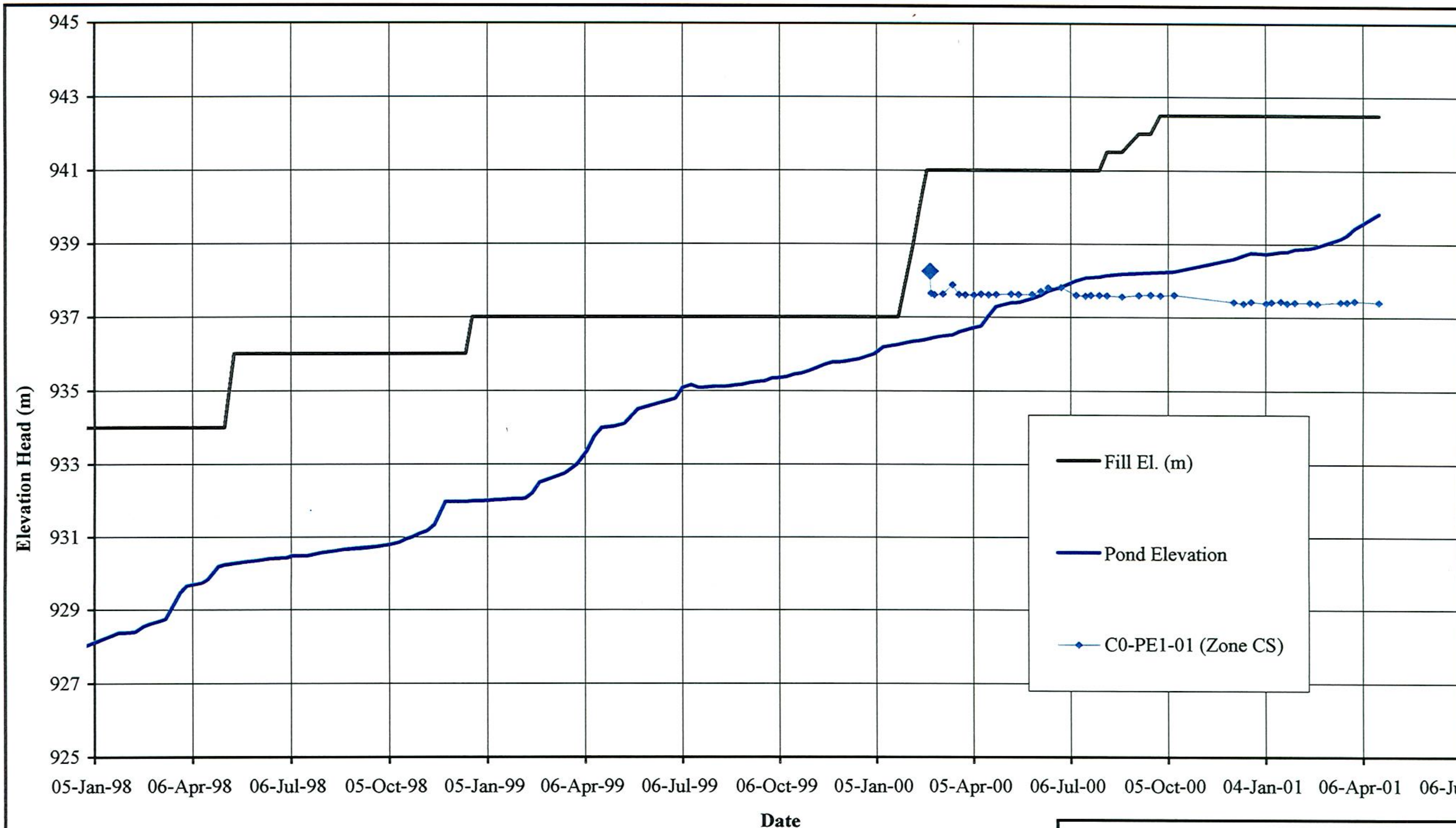
M:\11162\14\report\2\Plane C_r0.xls\tails piezos

9/27/01



MOUNT POLLEY MINING CORPORATION	
MOUNT POLLEY MINE	
PLANE C TAILINGS PIEZOMETERS ELEVATION HEAD vs. TIME	
Knight Piésold CONSULTING	PROJECT NO. 11162/14 · REF NO. 2 · REV. 0
	FIGURE B1-3

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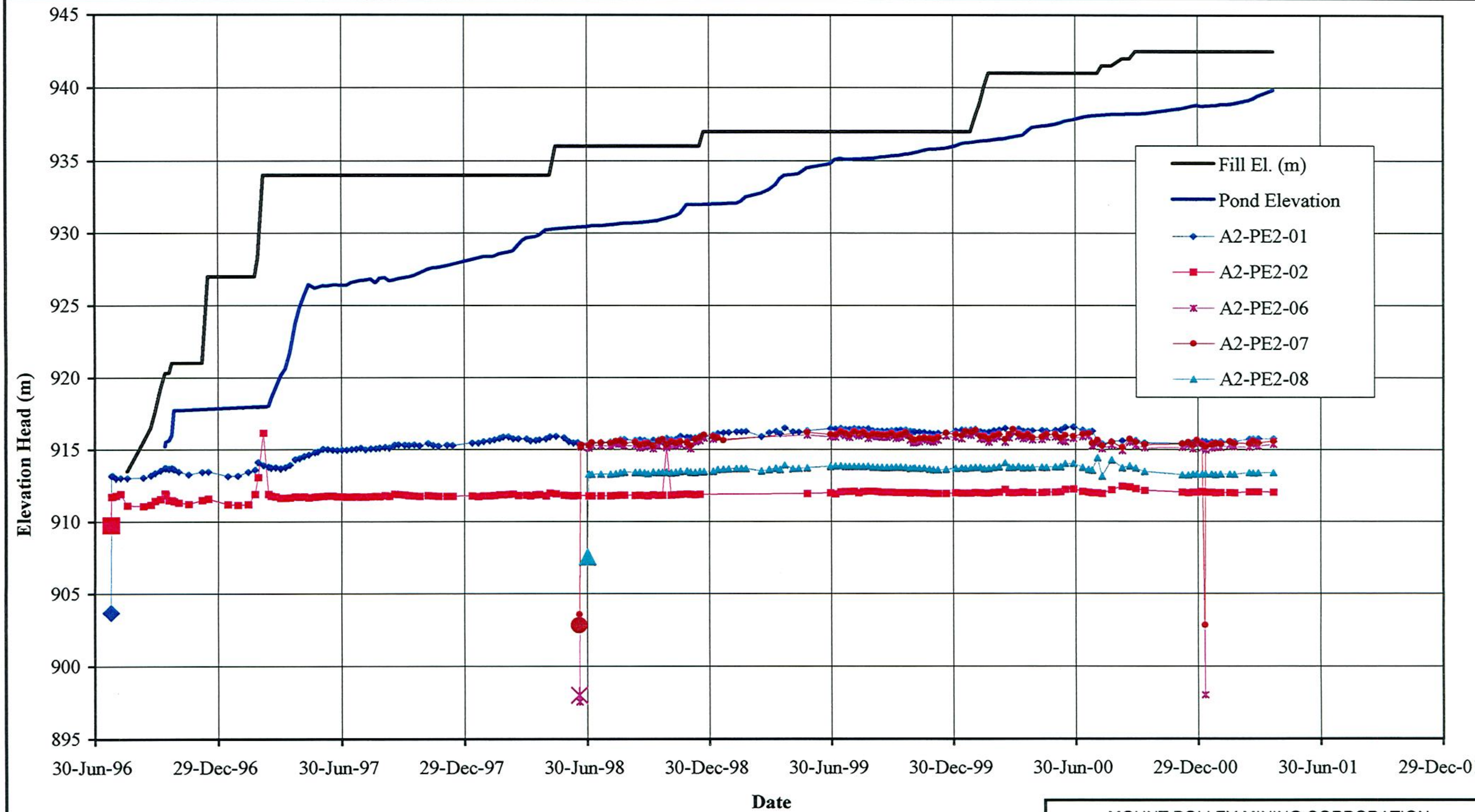
Knight Piésold CONSULTING

APPENDIX B2
(REV 0)

EMBANKMENT FOUNDATION PIEZOMETER RECORDS

M:\11162\14\report\2\Plane A_r0\fdn piezos

9/27/01



MOUNT POLLEY MINING CORPORATION	
MOUNT POLLEY MINE	
PLANE A FOUNDATION PIEZOMETERS ELEVATION HEAD vs. TIME	
Knight Piésold CONSULTING	PROJECT NO. 11162/14 · REF NO. 2 · REV. 0
	FIGURE B2-1

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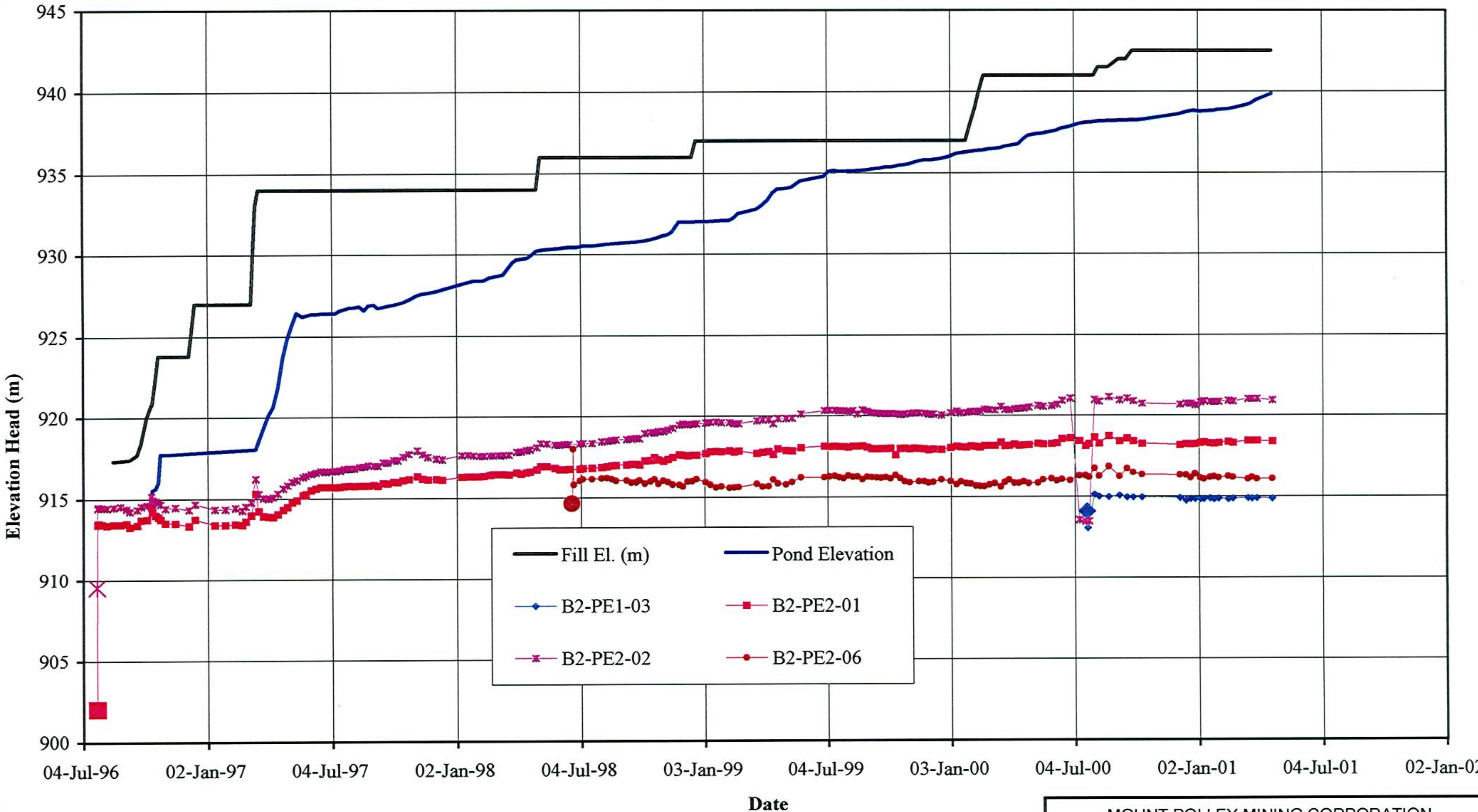
M:\11162\14\report\2\Plane B_r0\fdn piezos

9/27/01



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MOUNT POLLEY MINING CORPORATION			
MOUNT POLLEY MINE			
PLANE B FOUNDATION PIEZOMETERS ELEVATION HEAD vs. TIME			
Knight Piésold CONSULTING	PROJECT NO. 11162/14	REF NO. 2	REV. 0
	FIGURE B2-2		

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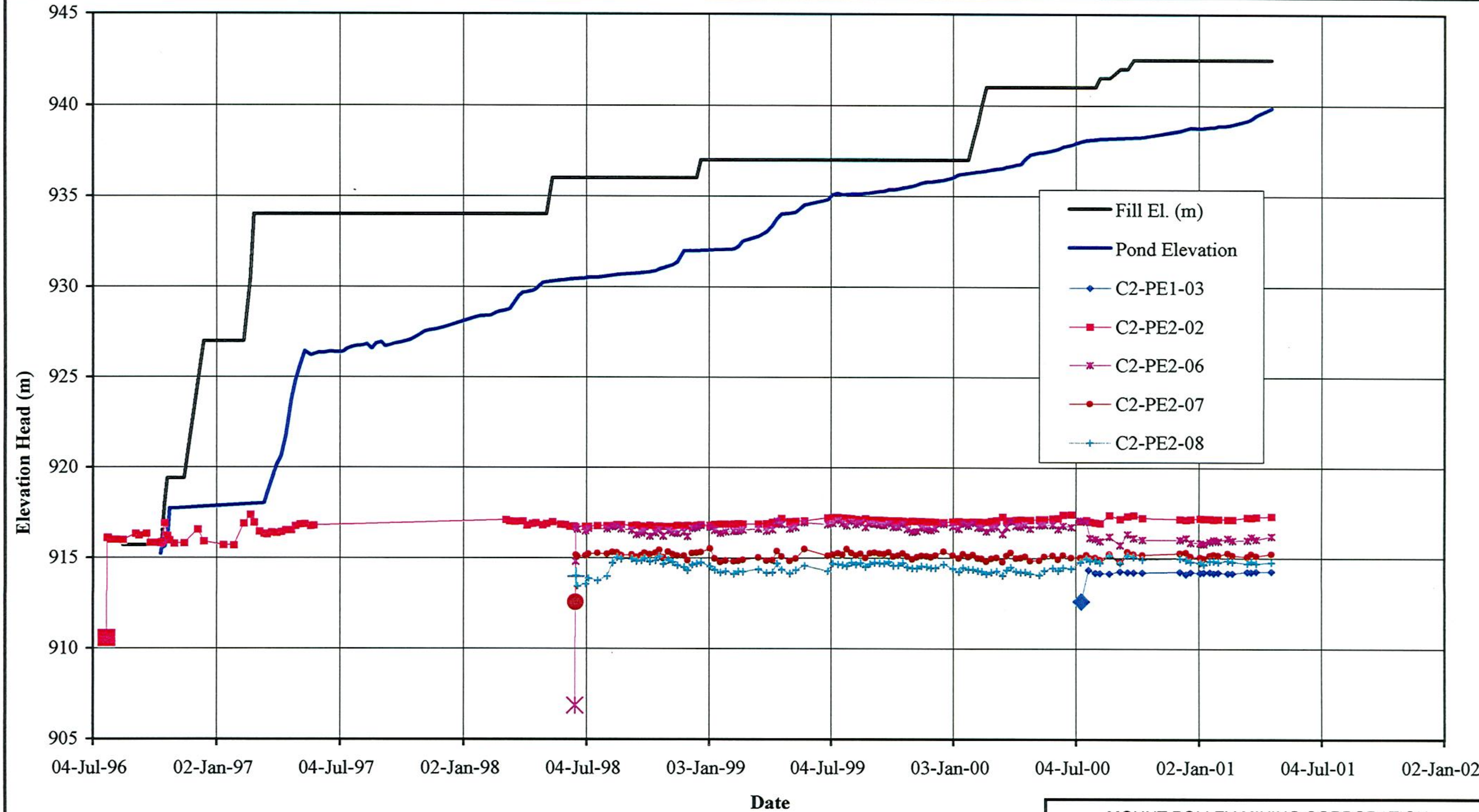
9/27/01

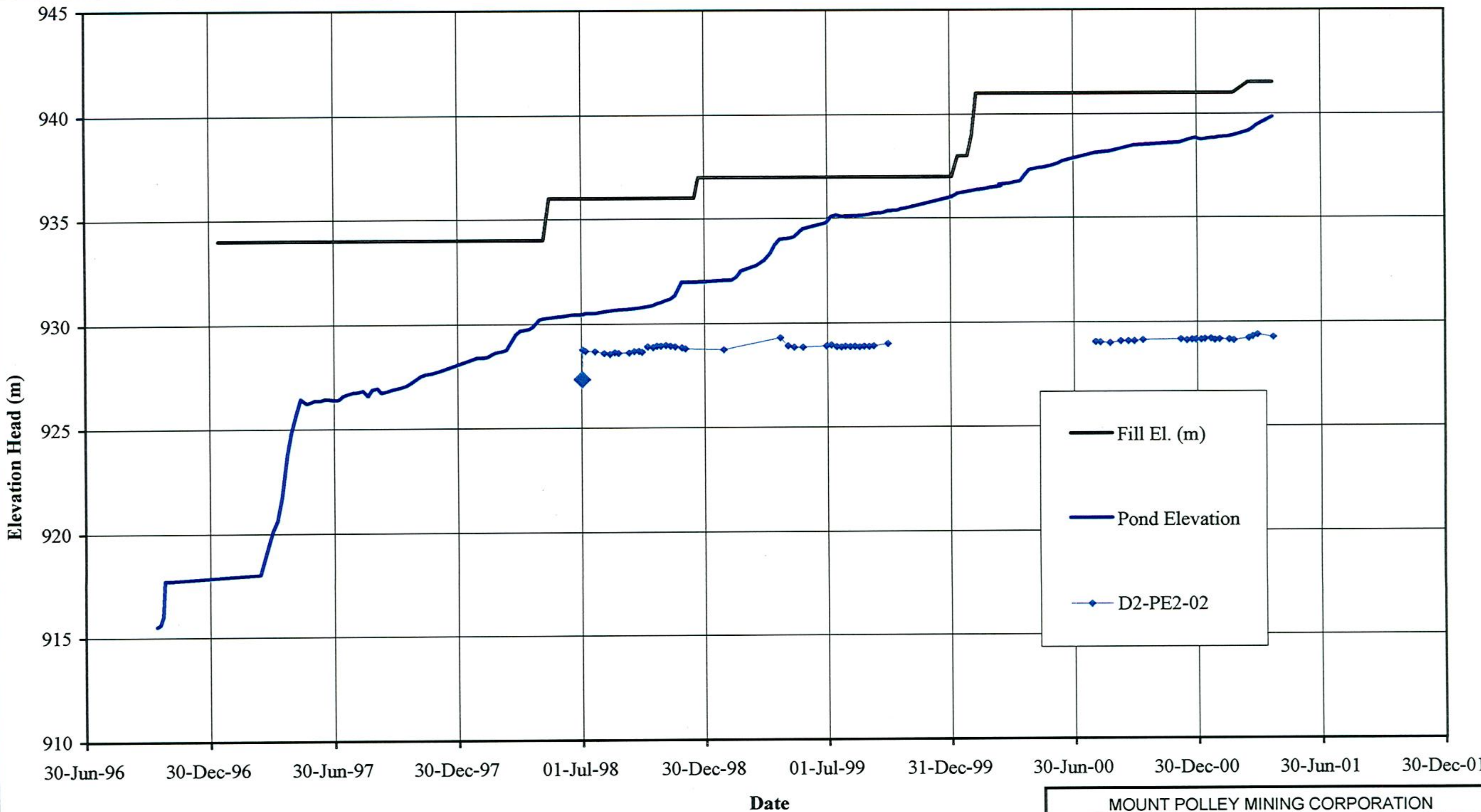


MOUNT POLLEY MINING CORPORATION	
MOUNT POLLEY MINE	
PLANE C FOUNDATION PIEZOMETERS ELEVATION HEAD vs. TIME	
Knight Piésold CONSULTING	PROJECT NO. 11162/14 · REF NO. 2 · REV. 0
	FIGURE B2-3

Rev 0 - Issued with Report on 2000 and 2001 Annual Inspection

M:\11162\14\report\2\Plane D_r0.xls\fdn piezos

9/27/01



MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

PLANE D FOUNDATION PIEZOMETERS
ELEVATION HEAD vs. TIME

Knight Piésold CONSULTING

PROJECT NO.	REF NO.	REV.
11162/14	2	0

FIGURE B2-4

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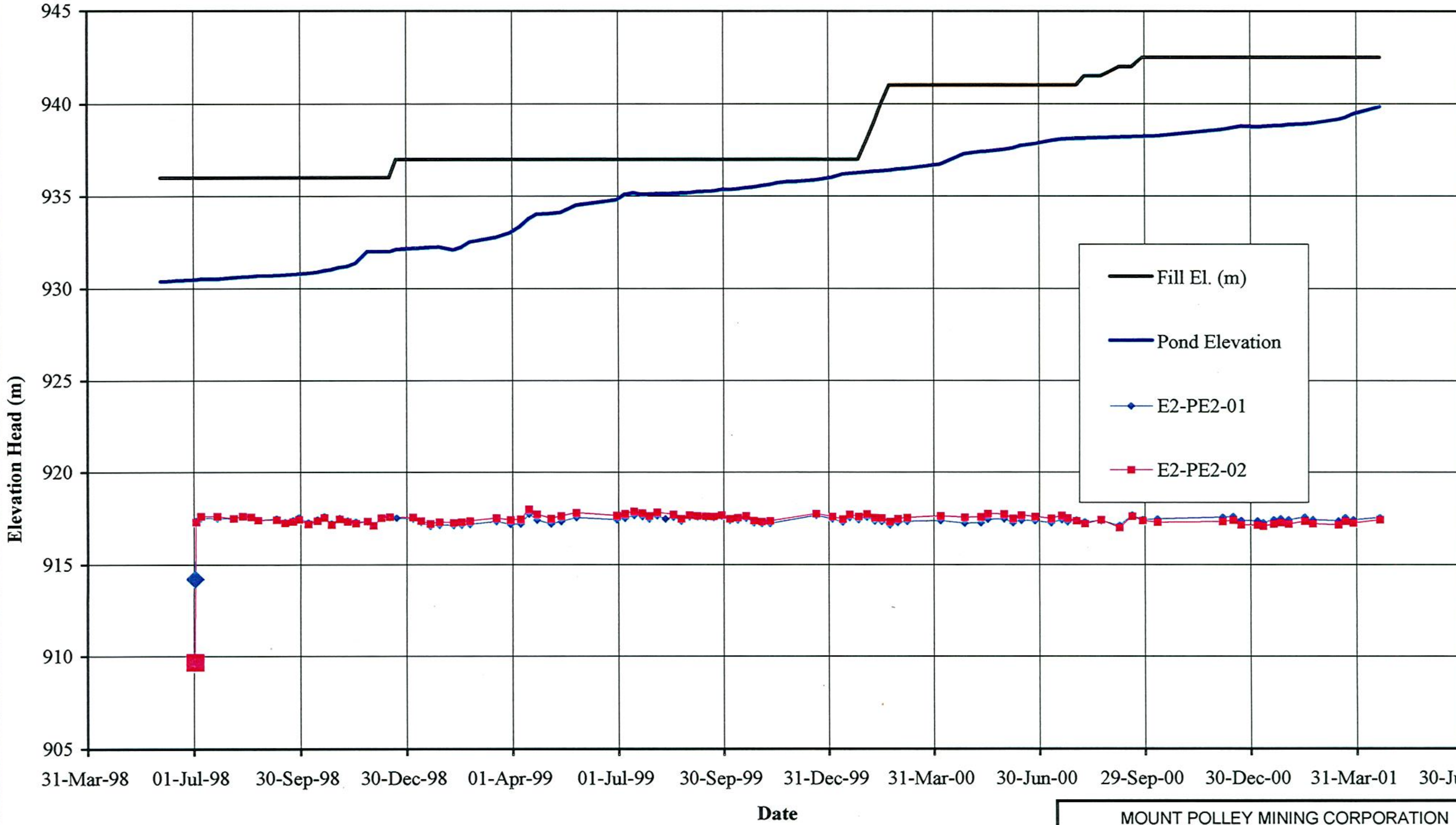

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

PLANE E FOUNDATION PIEZOMETERS
ELEVATION HEAD vs. TIME

Knight Piésold CONSULTING

PROJECT NO.	REF NO.	REV.
11162/14	2	0

FIGURE B2-5

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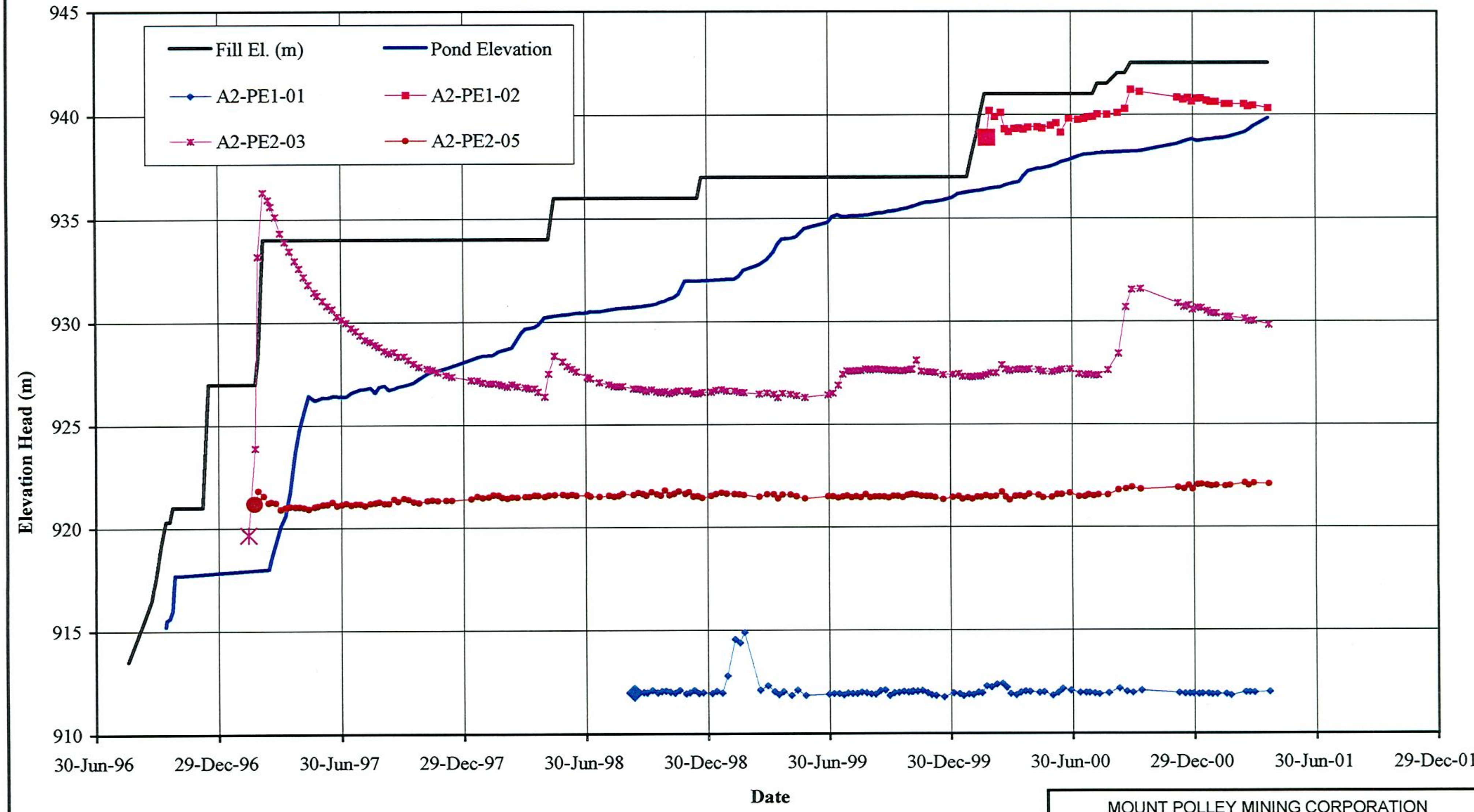
APPENDIX B3
(REV 0)

EMBANKMENT FILL PIEZOMETER RECORDS

M:\11162\14\report\2\Plane A_r0.xls\fill piezos

9/26/01



MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
PLANE A FILL PIEZOMETERS **ELEVATION HEAD vs. TIME**

Knight Piésold CONSULTING

PROJECT NO.	REF NO.	REV.
11162/14	2	0

FIGURE B3-1

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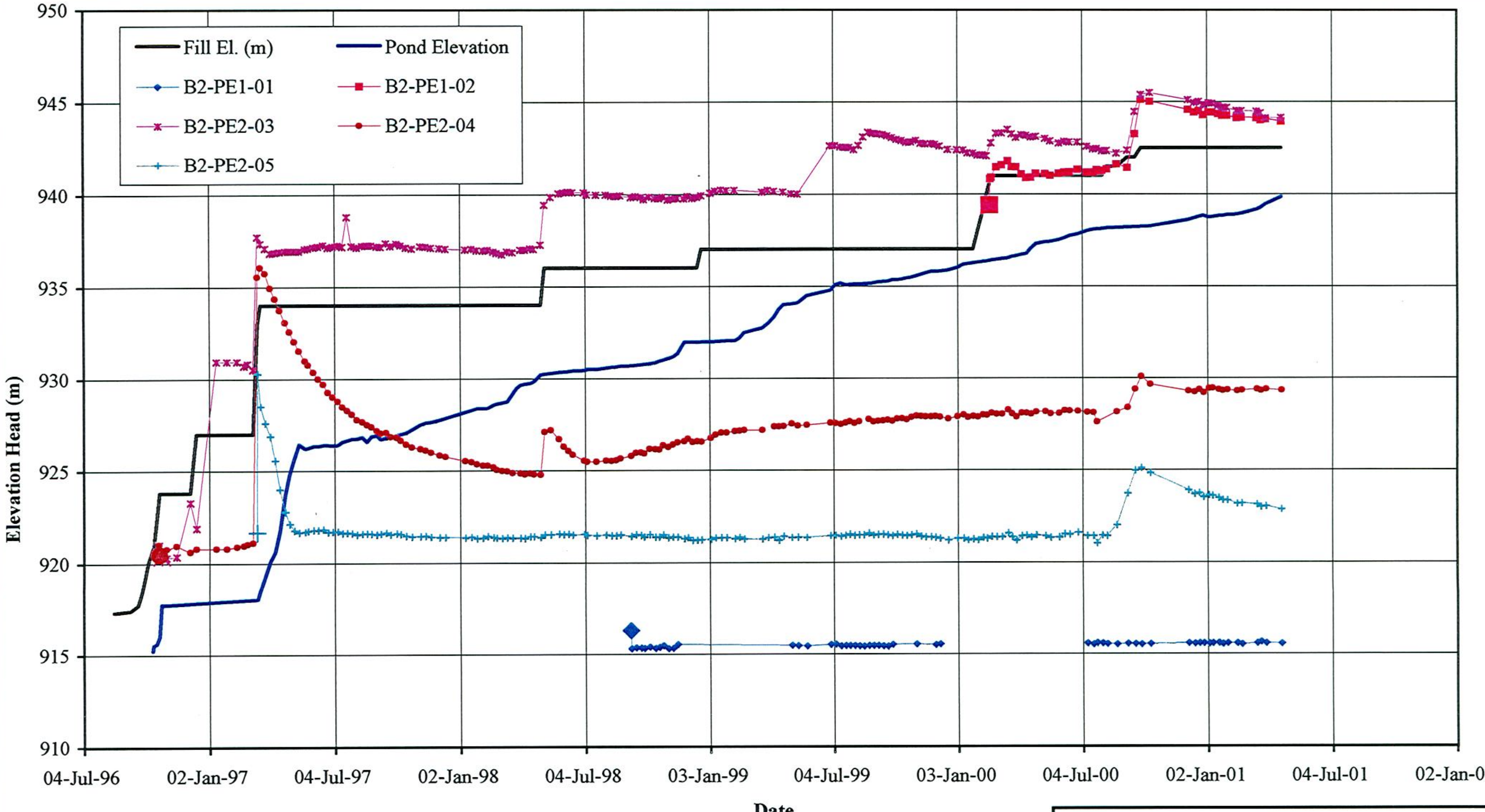

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

PLANE B FILL PIEZOMETERS
ELEVATION HEAD vs. TIME

Knight Piésold CONSULTING

PROJECT NO.	REF NO.	REV.
11162/14	2	0

FIGURE B3-2

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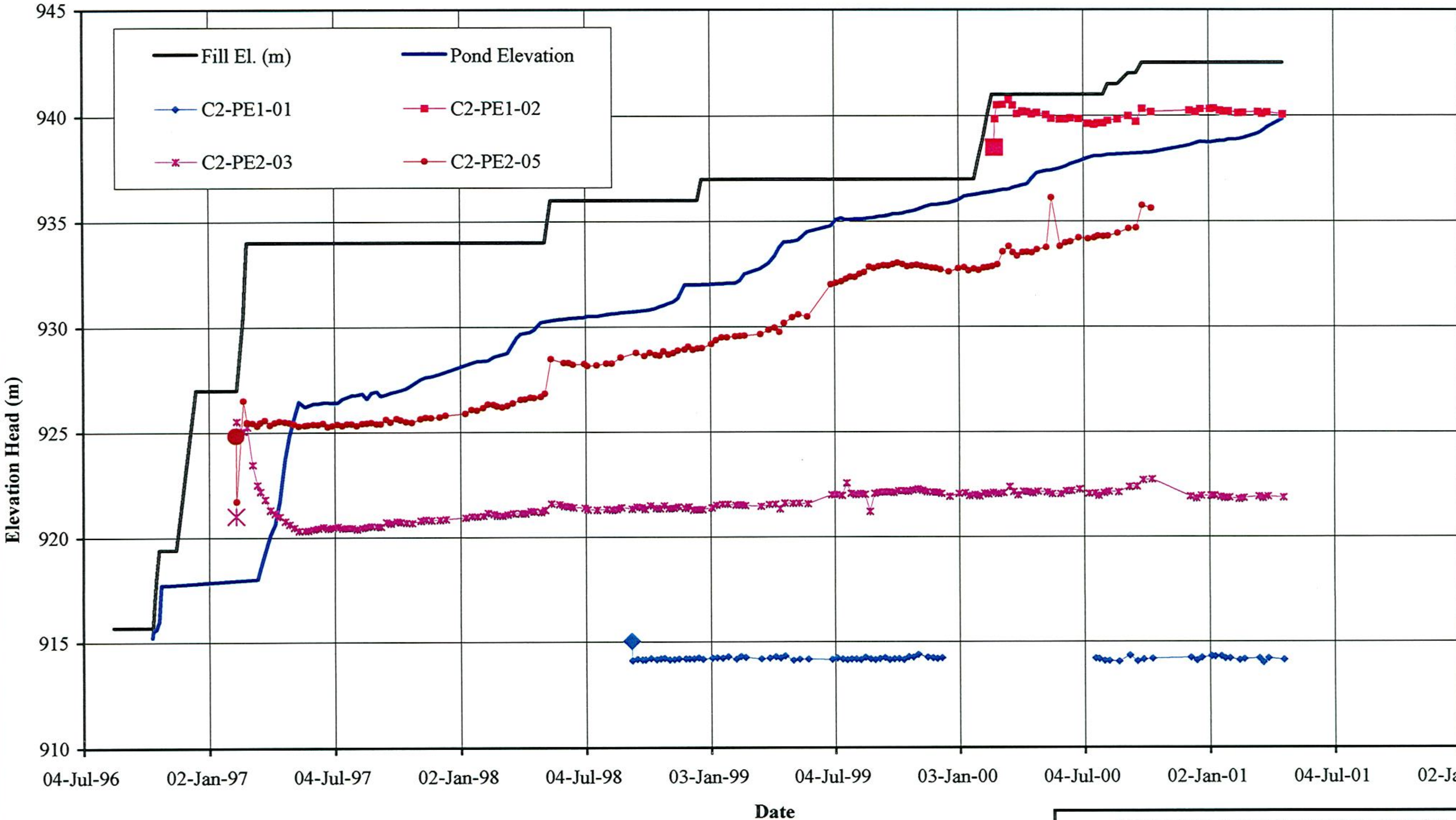
M:\11162\14\report\2\Plane C_r0.xls\fill piezos

9/27/01



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MOUNT POLLEY MINING CORPORATION	
MOUNT POLLEY MINE	
PLANE C FILL PIEZOMETERS ELEVATION HEAD vs. TIME	
Knight Piésold CONSULTING	PROJECT NO. 11162/14 · REF NO. 2 · REV. 0
	FIGURE B3-3

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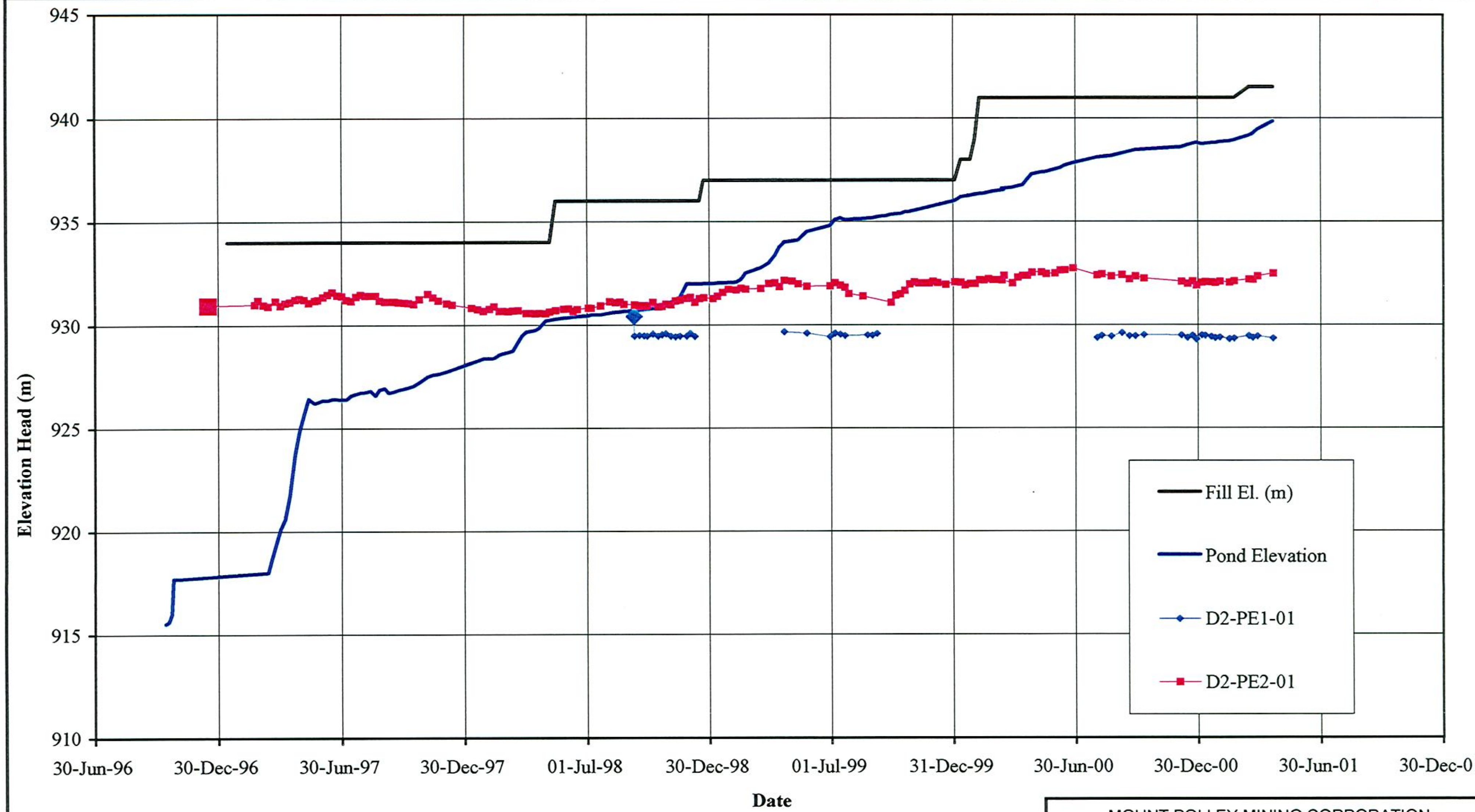

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

PLANE D FILL PIEZOMETERS
ELEVATION HEAD vs. TIME

Knight Piésold CONSULTING

PROJECT NO.	REF NO.	REV.
11162/14	2	0

FIGURE B3-4

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APPENDIX B4
(REV 0)

DRAIN PIEZOMETER RECORDS

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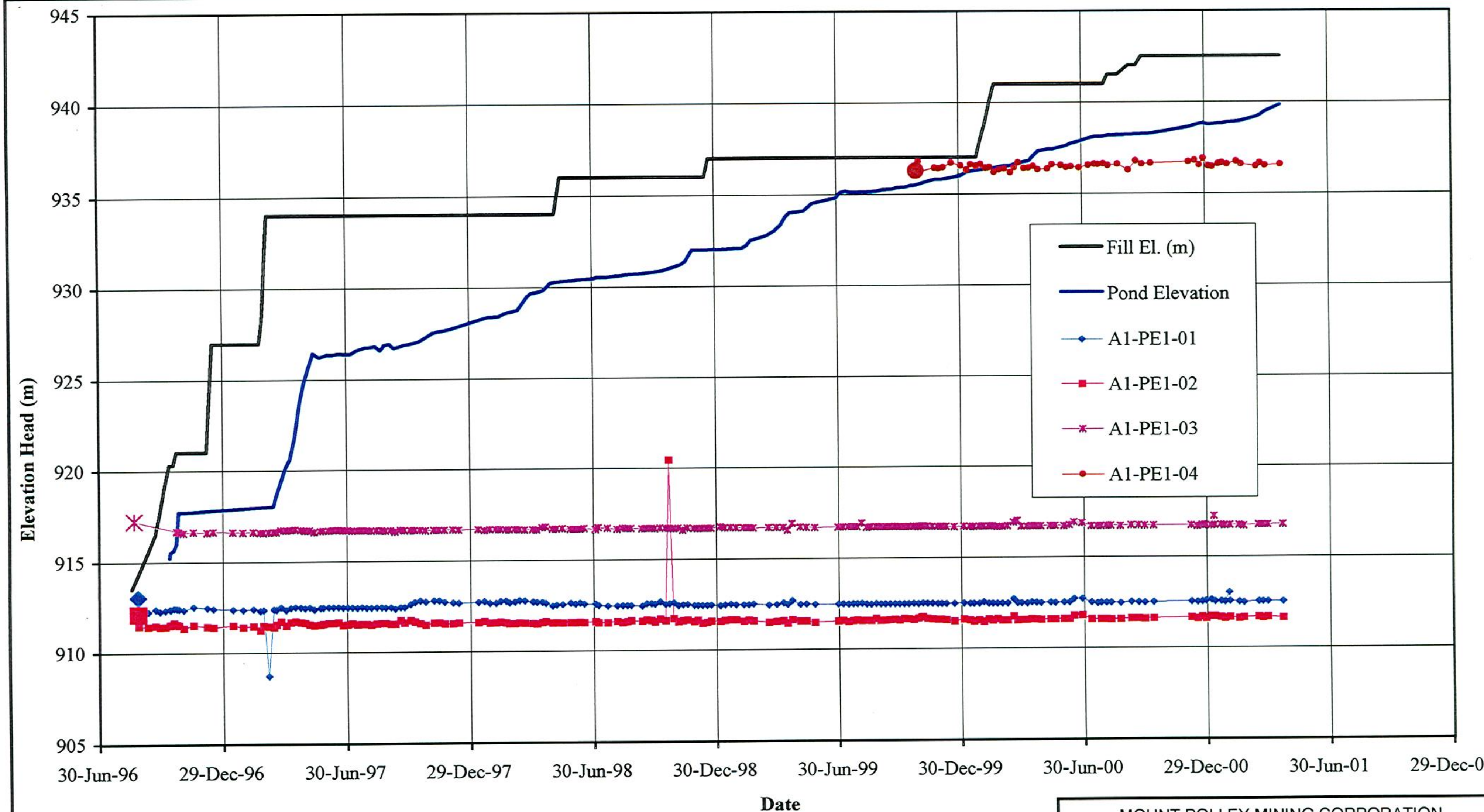

MOUNT POLLEY MINING CORPORATION		
MOUNT POLLEY MINE		
PLANE A DRAIN PIEZOMETERS ELEVATION HEAD vs. TIME		
PROJECT NO. 11162/14	REF NO. 2	REV. 0
Knight Piésold CONSULTING	FIGURE B4-1	

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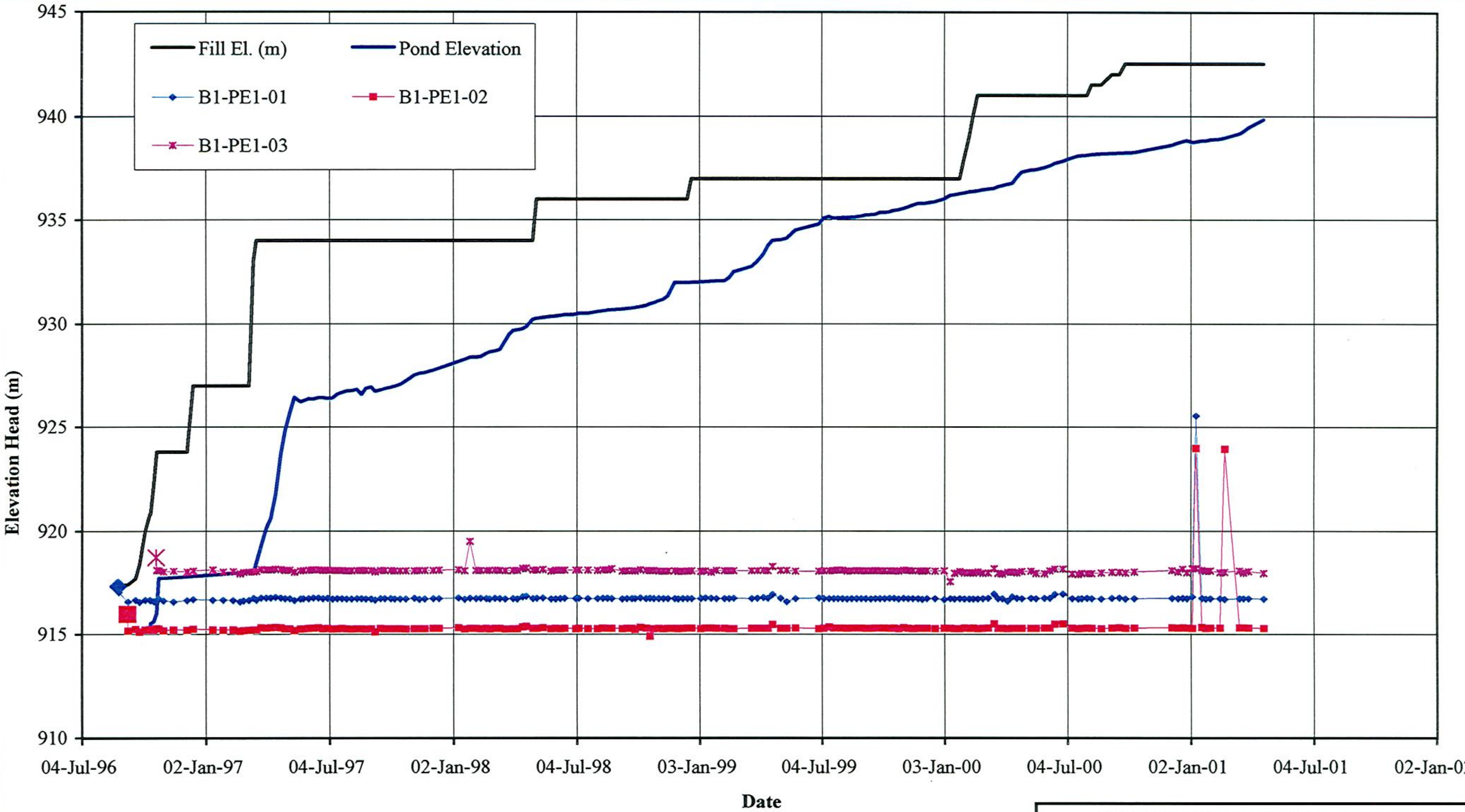
9/27/01



MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
PLANE B DRAIN PIEZOMETERS **ELEVATION HEAD vs. TIME**

Knight Piésold CONSULTING

PROJECT NO.	REF NO.	REV.
11162/14	2	0

FIGURE B4-2

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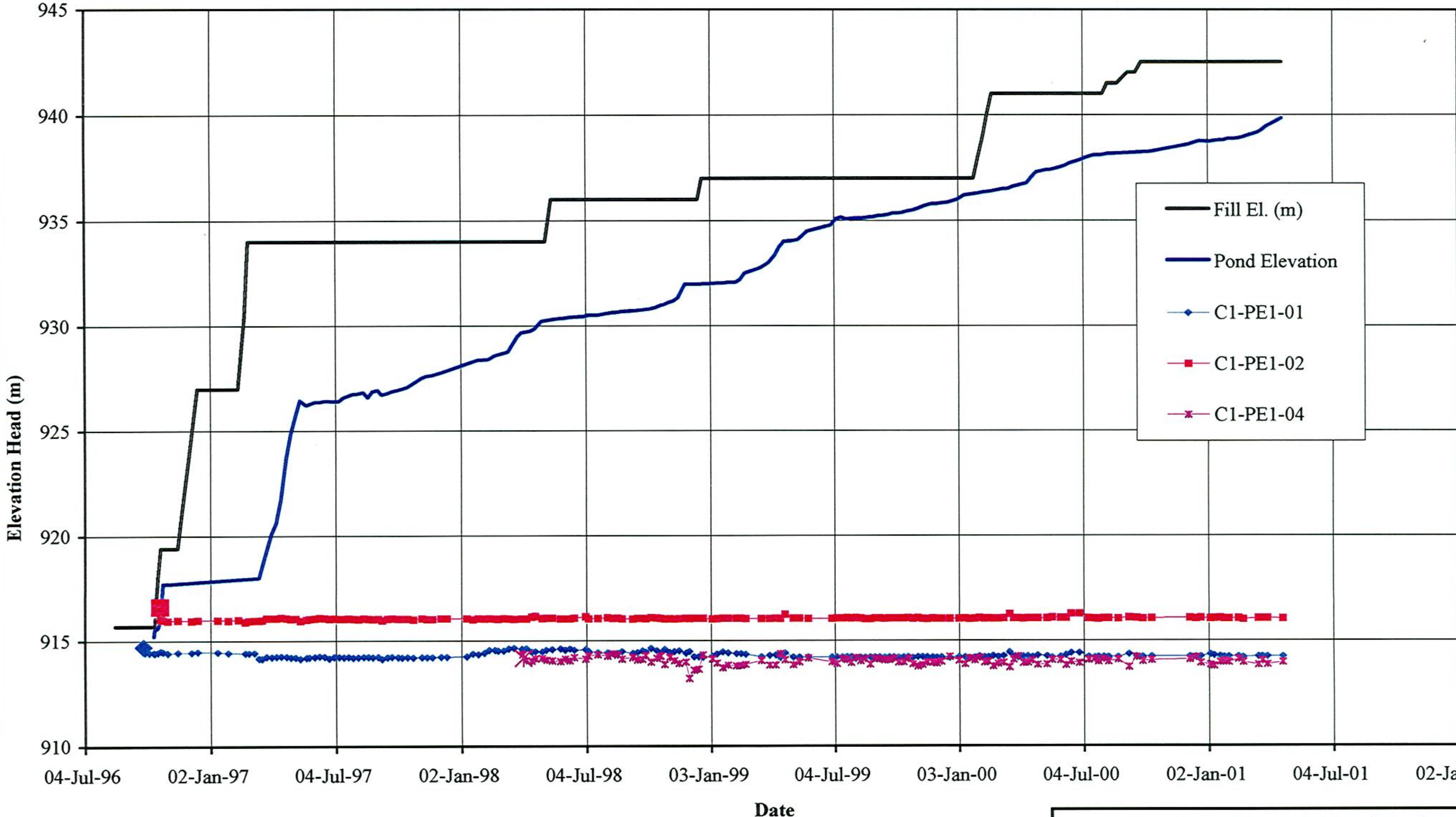

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
PLANE C DRAIN PIEZOMETERS **ELEVATION HEAD vs. TIME**

Knight Piésold CONSULTING

PROJECT NO.	REF NO.	REV.
11162/14	2	0

FIGURE B4-3

Rev 0 - Issued with Report on 2000 and 2001 Annual Inspection

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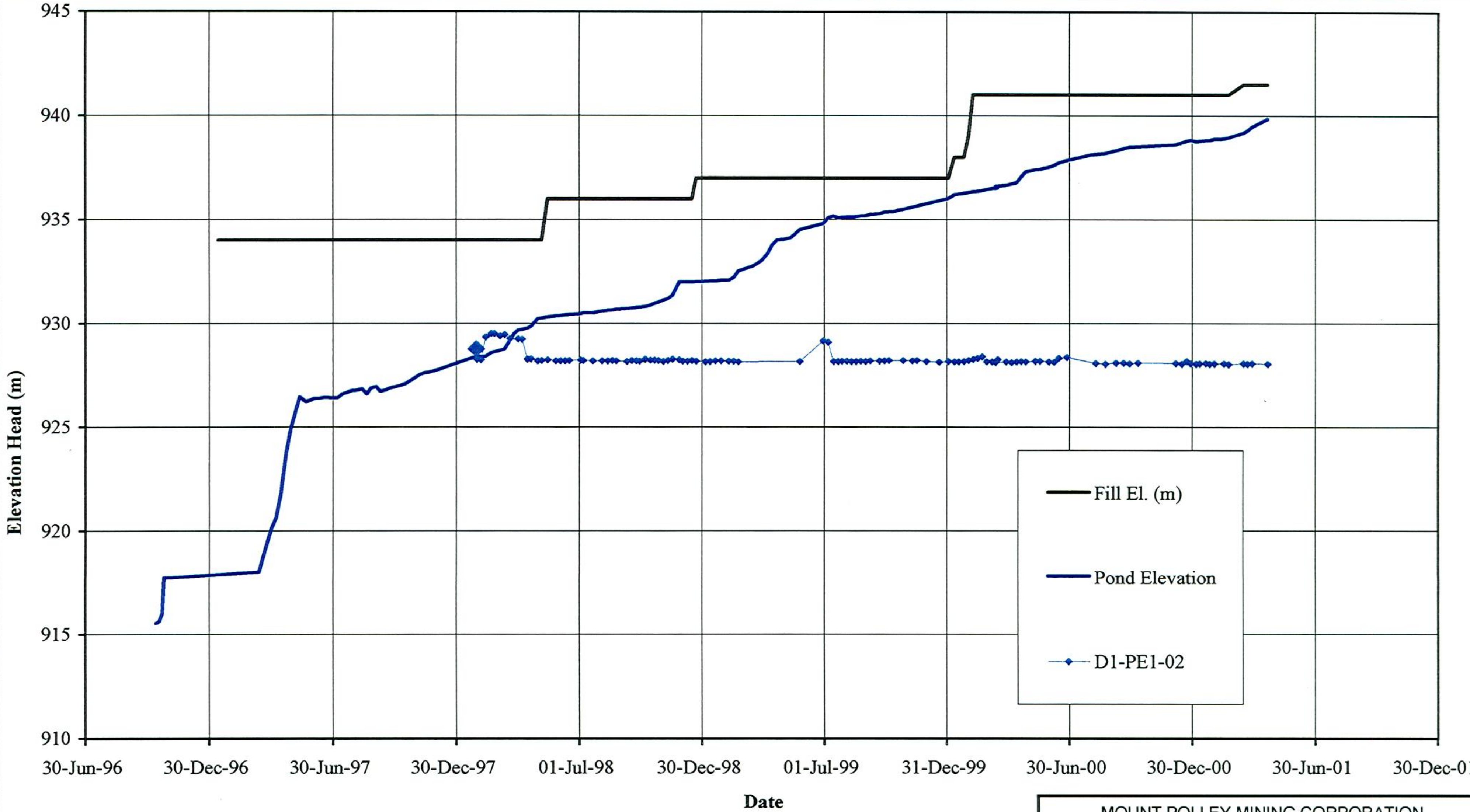

MOUNT POLLEY MINING CORPORATION		
MOUNT POLLEY MINE		
PLANE D DRAIN PIEZOMETERS ELEVATION HEAD vs. TIME		
PROJECT NO. 11162/14	REF NO. 2	REV. 0
FIGURE B4-4		

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APPENDIX C
(REV 0)

DRAIN FLOW RECORDS

Figure C-1, Rev. 0	Tailings Storage Facility - Upstream Toe Drain Flows
Figure C-2, Rev. 0	Tailings Storage Facility – Main Embankment – Foundation Drain Flows

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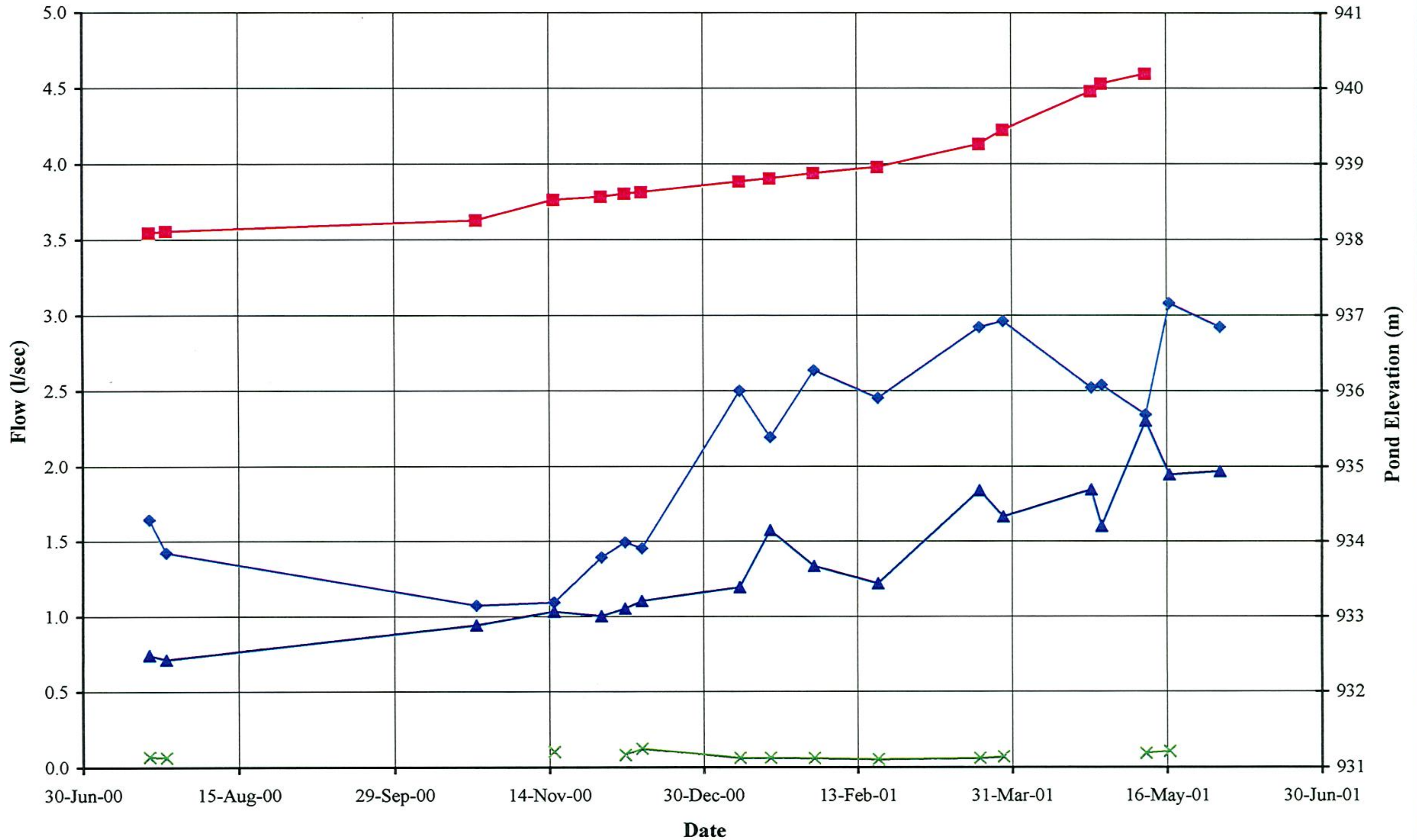
Printed:07-09-01
Revised : 05-Jun-2001



MOUNT POLLEY MINING CORPORATION		
MOUNT POLLEY MINE		
TAILINGS STORAGE FACILITY UPSTREAM TOE DRAIN FLOWS		
PROJECT NO. 11162/14	REF. 2	REV 0
FIGURE C-1		

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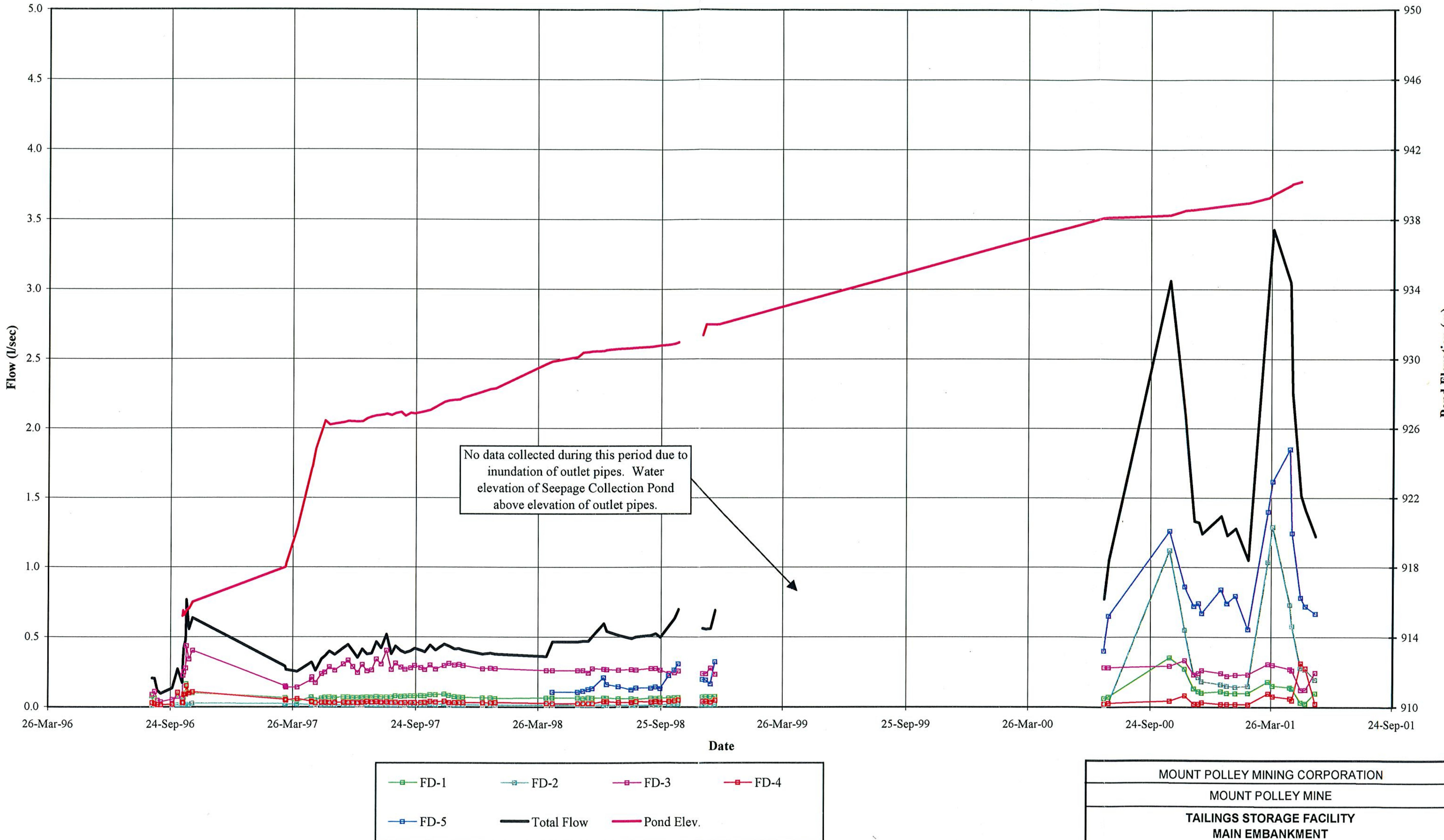

MOUNT POLLEY MINING CORPORATION	
MOUNT POLLEY MINE	
TAILINGS STORAGE FACILITY MAIN EMBANKMENT FOUNDATION DRAIN FLOWS	
Knight Piésold CONSULTING	PROJECT NO. 11162/14 · REF. NO. 2 · REV. 0
	FIGURE C-2

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APPENDIX D
(REV 0)

LETTER ON PERIMETER EMBANKMENT STABILITY ANALYSES
DATED MARCH 14, 2001

Knight Piésold
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COPY

Mr. Don Parsons / Eric LeNeve
Moun Polley Mine Site
Mount Polley Mining Corporation
P.O. Box 12
Likely, B.C.

Our Reference: 11162/14.01
Number: 1/0745
March 14, 2001

Dear Mr. Parsons / LeNeve,

Re: Perimeter Embankment Stability Analyses

As requested, we have completed stability analyses for the Perimeter Embankment at the Mount Polley Tailings Storage Facility. Embankment stability analyses were performed using limit equilibrium methods to determine the minimum factors of safety. The Perimeter Embankment was modelled with the crest elevation at 945 metres, which corresponds to the conclusion of Stage 3B construction. Both the cycloned sand and rockfill construction options were examined.

Analyses have been performed to investigate the stability of the embankment under both static and seismic conditions. The cases analysed in the stability assessment were as follows:

- Static conditions following construction of the Stage 3B Perimeter Embankment.
- Seismic loading conditions from the Operating Basis Earthquake (OBE) and Maximum Design Earthquake (MDE), as determined by the hazard classification for the Tailings Storage Facility.
- Post-liquefaction conditions, with residual strength applied to potentially liquefiable saturated beach tailings.

Both upstream and downstream embankment stability were examined. The Perimeter Embankment geometry and the material properties used in the analyses are shown on Figure 1. The location of the phreatic surface was based on existing piezometer data.

The minimum required factor of safety for the embankment under static loading conditions is 1.3 for short-term operating conditions. The post-liquefaction analyses were carried out to determine the potential for a flow slide in the event of liquefaction of the stored tailings. Generally, if the factor of safety is less than about 1.1 to 1.2 for the post-liquefaction case, there is a potential for large deformations during or shortly after earthquake loading. The minimum required factor of safety adopted for the post liquefaction case is 1.2.

The seismic stability of the embankment was analyzed using a conventional pseudostatic method. This method analyzes the stability of the embankment under earthquake loading by applying a horizontal seismic coefficient to the potential sliding mass. Iterative stability analyses are carried out to determine the seismic coefficient that reduces the factor of safety to 1.0. This critical seismic coefficient corresponds to the yield acceleration, the acceleration required to initiate movement of a potential sliding mass. Maximum accelerations along potential slip surfaces have been predicted from a seismic response analysis, for the OBE and MDE events. When the maximum acceleration predicted along a potential slip surface exceeds the yield acceleration, displacements can occur. If the yield acceleration is greater than the predicted maximum acceleration along a potential slip surface (factor of safety remains greater than 1.0) it indicates that seismically induced deformations of the tailings embankment, if any, will be negligible.

The program SHAKE was used to compute profiles of maximum acceleration within the tailings and embankment fill. For the beach tailings and cycloned sands materials, values of soil stiffness (shear modulus) required in the analysis were calculated from measured shear wave velocities recorded during the 1999 SCPT program. Stiffness parameters used for the embankment fill and foundation soils were based on SPT blow count data measured during the 1996 foundation investigations and typical values for similar materials. Appropriate earthquake acceleration time history records were used in the analysis to represent the OBE and MDE events.

The results of the stability analyses indicate that the minimum factors of safety under static conditions for the downstream critical slip surfaces of the Stage 3B Perimeter Embankment were 1.8 and 2.0 for the cycloned sand and rockfill sections respectively. Typical slip surfaces for the downstream static analyses are shown on Figure 2. The minimum factor of safety for upstream stability is 2.0, regardless of whether the downstream section is constructed with cycloned sands or rockfill. The potential slip surfaces and resulting factors of safety correspond to cases where failure may result in a loss of freeboard. Shallower slip surfaces produced slightly lower factors of safety, although still within acceptable limits.

From the dynamic response analysis, the average maximum accelerations predicted for the OBE are approximately 0.10g for the downstream case and 0.08g for the upstream case. Similarly, for the MDE the average maximum accelerations are approximately 0.20g for the downstream case and 0.17g for the upstream case. The results of the seismic stability analyses indicate that the yield accelerations are approximately 0.30g for the downstream case and 0.22g for the upstream case. The calculated yield accelerations exceed the average maximum ground accelerations determined from the dynamic response analyses. Therefore, seismically induced embankment deformations, if any, would be negligible for both the OBE and MDE events.

The factor of safety for the upstream face of the embankment under post liquefaction conditions is 1.2. Typical potential slip surfaces for the upstream static and post liquefaction analyses are shown on Figure 3.

The results of the stability analyses for the Stage 3B Perimeter Embankment for static and post liquefaction conditions are summarized in Table 1. The stability analyses demonstrate that the Stage 3B Perimeter Embankment is stable and calculated factors of safety exceed the minimum required factors of safety.

We trust that the discussions presented meet your current needs. Please contact me if you have any questions.

Yours very truly,
KNIGHT PIÉSOLD LTD.

Graham Greenway, P. Eng
Senior Engineer

Ken Brouwer, P.Eng
President

Enclosures:	Table 1 Rev 0	Results of Stage 3B Perimeter Embankment Stability Analyses
	Figure 1 Rev 0	Summary of Soil and Foundation Parameters
	Figure 2 Rev 0	Summary of Downstream Static Failures
	Figure 3 Rev 0	Upstream Static and Post Liquefaction Failures

/cwm