

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
STAGE 3 CYCLONED SAND
TAILINGS EMBANKMENT
PROJECT PROCEDURES MANUAL
(REF. NO. 11162/12-1)

Rev. No.	Revision	Date	Approved
0	Issued for Project	October 13, 1999	KJB

Knight Piésold Ltd.

Suite 1400
750 West Pender Street
Vancouver, British Columbia
Canada V6C 2T8

Telephone: (604) 685-0543

Facsimile: (604) 685-0147

E-mail: kpl@knightpiesold.bc.ca

Knight Piésold
CONSULTING

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
STAGE 3 CYLCONED SAND TAILINGS EMBANKMENT

PROJECT PROCEDURES MANUAL
(REF. NO. 11162/12-1)

TABLE OF CONTENTS

	<u>PAGE</u>
SECTION 1.0 SCOPE OF MANUAL	1
SECTION 2.0 WORK PLAN	2
2.1 BACKGROUND	2
2.2 GENERAL APPROACH	2
2.3 TASK DESCRIPTIONS	3
SECTION 3.0 PROJECT ORGANIZATION AND CONTACT LIST	5
SECTION 4.0 PROJECT SCHEDULE AND BUDGET	6
SECTION 5.0 PROJECT CRITERIA	7
SECTION 6.0 PROGRESS REPORTING AND INVOICING	8
SECTION 7.0 PROJECT FILING SYSTEM	9
SECTION 8.0 QUALITY PLAN	11
SECTION 9.0 DELIVERABLES	14

TABLES

Table 1, Rev. 0	Communications List
Table 2, Rev. 0	Scale of Fees
Table 3, Rev. 0	Reimbursable Expenses
Table 4, Rev. 0	Budget Summary
Table 5, Rev. 0	Estimated Engineering Time Charges
Table 6, Rev. 0	Estimated Disbursements

FIGURES

Figure 1, Rev. 0	Project Schedule
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APPENDICES

Appendix A, Rev. 0	Draft Table of Contents for the Final Report
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MOUNT POLLEY MINING CORPORATION
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STAGE 3 CYCLONED SAND TAILINGS EMBANKMENT

PROJECT PROCEDURES MANUAL
(REF. NO. 11162/12-1)

SECTION 1.0 - SCOPE OF MANUAL

This Manual outlines the scope of work, structure and responsibilities for the construction of the Stage 3 cycloned sand tailings embankment at the Mount Polley Mine. This Manual identifies the KP Project Team and specifies the procedures for administering and executing the KP portions of the work.

The Manual is intended for the use of Knight Piésold Ltd. staff only. It contains confidential information and should be treated accordingly.

Other documents relevant to the execution of the work include the following:

Report No. 1627/2 'Updated Design Report'

Report No. 11162/10-1 (Rev. 0) '1998 Construction and Annual Inspection'

Report No. 11162/11-1 (Rev. 0) 'Evaluation of Cycloned Tailings for Embankment Construction'

SECTION 2.0 - WORK PLAN

2.1 BACKGROUND

The Tailings Storage Facility at the Mount Polley Mine is currently permitted to the Stage 2C elevation of 940 metres above sea level. The current embankment elevation is 937 masl, and Stage 2C is scheduled for construction during the fall of 1999.

2.2 GENERAL APPROACH

In order to reduce construction costs for future raises KP have been requested by Mount Polley Mining Corporation (MPMC) to assess and design future raises using cycloned tailings. As a result, a downstream trial program is to be undertaken to assess the in-situ cycloned sand properties and deposition characteristics. The Stage 3 embankment will be designed and submitted for permitting based on the interpreted results of this trial. The proposed change in design philosophy with operating, maintenance and surveillance (OM&S) procedures necessitate the updating of the design document.

A risk assessment of the cycloned sand operation will be performed as part of the overall design process. Furthermore at the request of MPMC, KP have also been asked to assist in a feasibility study for the long-term storage of bio-solids within the catchment of the tailings storage facility (TSF) required by the Ministry of Environment, Lands and Parks (MELP).

Every entry in a time sheet must have a project/assignment number and a task number entered. Each assignment is broken down into separate areas of work or tasks. This is done for planning, management and tracking purposes. Each task is assigned a four-digit task number as follows:

- The first two digits are sequential numbers for each task starting at 01
- The third digit is reserved for subtasks if required. If not this digit is 0.
- The fourth digit is either a 0 if project work is being carried out or 3 if review under the quality plan for the project is being carried out.



2.3 TASK DESCRIPTIONS

Task 0100 – Project Management

This task will involve all work related to the overall review of design works and progress to ensure that the project is meeting the clients needs within the proposed budget.

Task 0200 – Site Supervision

On-site supervision will be provided during the cycloned sand trial program. The purpose of the trial is to establish the in-situ engineering properties and deposition characteristics and confirm the ability of operations to consistently produce cycloned sand of sufficient quality and quantity.

Site supervision will also include the installation, monitoring and interpretation of piezometers installed within the trial berm, surveying and sampling of the cycloned sand for laboratory testing, monitoring of construction activity related to the trial, and supervision of a cone penetration testing program.

Task 0300 – Detailed Design of Cycloned Sand Embankment

Laboratory testing will be performed on representative samples from the trial berm. From these results a comparison to other cycloned sand embankments will be undertaken, CPT data will be compiled and the filling schedules and embankment staging will be updated. A risk assessment will be performed for the new design of the embankments. Instrumentation and monitoring requirements will be reviewed. Closure and reclamation requirements will be discussed. Upon completion of the analysis work, construction drawings and a design report will be provided. The preliminary table of contents for this design report, indicating the various tasks and analyses associated with the design is included as Appendix A of this document.

Task 0400 – Update Operating, Maintenance and Surveillance Procedures

The OM&S manual will be updated to reflect this design change to incorporate cycloned sand into the overall embankment construction.

Task 0500 – Miscellaneous Permitting Support

Tasks associated with the approval and permitting of this Stage 3 will be recorded under this task number.

Task 0600 – Bio-Solids/Reclamation

This work is a stand-alone item for Mr. Greg Smyth of MPMC. It will entail KP to produce a simple plan and section figures and potentially a brief letter report of the proposed arrangements that will be submitted to MELP by MPMC. Mr. Greg Smyth has approved a nominal budget of approximately \$1500.00 verbally.

SECTION 3.0 - PROJECT ORGANIZATION AND CONTACT LIST

The nominated personnel for KPL include:

- Ken Brouwer - Project Director
- John Wilkinson - Project Manager
- Leon Gous - Project Reviewer

In addition to the above listed personnel, additional staff will contribute as required.
The Project Director shall determine project staffing.

A Communications List, summarizing parties involved with the work, is included as Table 1. The list will be updated and re-issued as required.



SECTION 4.0 - PROJECT SCHEDULE AND BUDGET

The project work commenced with the initial downstream cycloned sand trial berm design in August 1999. The draft version of the final report is scheduled for the 15 November, and the final version is expected at the end of November after receipt of comments from the client. The schedule for the overall project is included as Figure 1, which is a combination of the 2C construction tasks and Stage 3 design works. The OM&S manual will require updating prior to final approval of the proposed cycloned sand construction method. The schedule provided in Figure 1 will be adjusted as the project proceeds.

The Scale of Fees and Reimbursable Expenses for the work are outlined in Tables 2 and 3, respectively. Cost estimates have been developed as shown in Tables 4 to 6, which are exclusive of the Task 0600 budget of approximately \$1500.00.

The signed Confirmation of Scope of Work form, which is a form of contract, is included as Appendix A.

SECTION 5.0 - PROJECT CRITERIA

The criteria by which this project will be measured for satisfactory completion are:

- Permanent, secure and total confinement of all solid waste materials behind the tailings dam.
- Control, collection and removal of all free draining liquids from the tailings / cycloned tailings during operations, for recycling as process water.
- Seepage from the tailings shall be collected and recycled.
- The stability of the dams shall meet standards set by the ICOLD.
- The updated design of Stage 3 of the TSF will be reported and permitted in a timely and cost-effective manner.

SECTION 6.0 - PROGRESS REPORTING AND INVOICING

During the site work, bi-weekly or semi-monthly progress reports will be issued from the mine site. These reports will summarize the recent progress and findings, and may be incorporated into the bi-weekly or semi-monthly construction reporting associated with KPL assignment number 11162/10. Monthly Progress Reports will be issued from the Vancouver design office with the monthly invoice. The progress on each Task will be summarized for the month, and will include site work as well as design office work. The reports will be issued to Mount Polley Mining Corporation.

Monthly invoices will be prepared and sent to Mount Polley Mining Corporation, and will be based on the following:

1. Timesheets completed on 15th and last day of month. Computer timesheets are to be included as required.
2. Reimbursable project expenses entered as they are received.
3. Invoices will be dated the last day of the month and will be based on actual time charges and reimbursable expenses. The invoices will be issued within 5 business days after month-end along with a summary of work completed for the month, the status of the budget and a task summary.

Time charges for the work must be allocated to the appropriate task number, as discussed in Section 2.0 of this manual. As per normal Knight Piésold Ltd. policy, the time sheets must be submitted to the Office Manager by 10:00 AM on the day after the reporting period.

Expense claims are to be submitted with the time sheets. Expenses must be categorized by task number, and the expense claim sheets must be supported with receipts.

SECTION 7.0 - PROJECT FILING SYSTEM

Project filing in the Vancouver office will be based on the standard filing system used by KPL. The following standard files will be utilized for filing in the Vancouver office as required:

CODE	TITLE
11162/12.00	Confidential Files
11162/12.01	General Correspondence
11162/12.02	Correspondence with Sub-contractors
11162/12.03	Laboratory Testing
11162/12.06	Correspondence with Site Office
11162/12.07	Copies of Site Correspondence
11162/12.08	Progress Reports
11162/12.10	Calculations (Box File)
11162/12.19	Invoices
11162/12.30	Quality Records

Files 11162/12.02 through 11162/12.08 may be incorporated into the general correspondence file (11162/12.01) due to the size of the project.

Filing in the Mount Polley site office will be based on the standard filing system. The following files will be utilized for filing in the site office as required:

CODE	TITLE
11162/12.F01	Correspondence with Vancouver office
11162/12.F02	Correspondence with Client
11162/12.F03	Correspondence with Contractor
11162/12.F05	Continuity Register (Note 1)
11162/12.F06	Minutes of Site Meetings, Schedule
11162/12.F07	Inspector's Reports
11162/12.F08	Weekly Progress Reports
11162/12.F10	Site Design Calculations

Notes:

1. The Continuity Register (.F05) is a Table that records all correspondence going out of the site office. The Table will contain the following information for each piece of outgoing correspondence:

- Site continuity number (e.g. 9/0001)
- Date
- Person to whom the correspondence was sent
- Site file number
- Topic of the correspondence

New files may be added as required during the course of the work.

SECTION 8.0 - QUALITY PLAN

The Quality Plan for the investigation and design work will comprise formal review of all aspects of the work in accordance with the KPL Quality Manual. The following are key calculations or processes that will require thorough review:

- Calculations for stability and seepage predictions of the proposed cycloned sand embankments
- Calculations of the anticipated availability and volume requirements for construction of Stage 3.
- Calculations of cycloned sand strength, permeability and drainage characteristics.
- Background data, including mill throughput, specific gravity of solids, process flow sheet, etc.
- All other design concepts, calculations, and drawings will be reviewed and checked by the Project Reviewer or his designate prior to the use of said items for further calculations or incorporation into letters, faxes or reports. In particular, qualified personnel shall review seepage and stability calculations for the dams and quantity and cost estimates for all recommended earthworks.
- To make the review as efficient as possible, the Project Manager prior to starting the work will establish formal Calculation Files and Project Reference Information files in the Vancouver office. This information will be stored in Box Files, and requirements for these files are discussed below.

Calculation Files

The established system for filing all calculations is to be followed. This system allows other engineers to locate and review the calculations in an

efficient manner. Design calculations will be kept in file number 11162/12.10. Calculation files will be stored in the Project Manager's office until the project is completed.

A typical set of calculations will include the following:

1. A Cover Page listing the Project/Assignment number, a description of the calculations, who the calculations are being done by, and who has checked the calculations.
2. Work Description - A description of the work item, reference information, assumptions, criteria and parameters and results.
3. Reference information, maps, reports, data sets, etc.
4. Hand-written notes, copies of relevant correspondence, Excel or Word files, drawings, sketch, etc. used or developed to complete the calculations.
5. A copy of the completed Review Record Form

Box Files

Box Files will be set up as required with the following label:

Project/Assignment No:	11162/12
Project Title:	Mount Polley Project
Assignment Description:	_____
Box File Number:	_____

Box Files will be used to store all calculation files (File 11162/12.10) and Project Reference Information received from the client (or others).

Each Box File must contain a Table of Contents listing all documents stored in it. All Box Files for the project shall be kept together in the Project

Manager's office while the Project is active. Once the Project is closed or becomes dormant, Box Files may be stored in the 15th Floor file storage room.

- The Project Director prior to issue to the client will review the weekly and monthly progress reports. They will form the basis for evaluating the quality of the work and to track the work progress.
- The Project Reviewer and the Project Director will review the Final Report.

The requirements for additional reviews will be defined during the progress of the work. Additional review procedures will be incorporated, as required.

SECTION 9.0 - DELIVERABLES

Anticipated deliverable items include the following:

- Bi-weekly progress reports from site during the trial berm work.
- Monthly progress reports from the Vancouver office.
- KPL final Report will be issued to MPMC to form the final Report entitled "Report on Cycloned Sand Construction of Stage 3 and On-Going Stages of the Tailings Storage Facility". A draft Table of Contents for this Report is included as Appendix A. The report will be issued in Draft for client review (Rev. A) and in Final (Rev. 0) after receipt and incorporation of the comments from the client.
- KPL's letter report or drawings on the bio-solids feasibility study will be issued to Greg Smyth of MPMC first in draft for his review. After receipt of his the report or drawings will be issued in final to MPMC.

Other deliverables may be specified during the work, but anything more than letters, faxes, etc. are beyond the current scope, and would require a Change in Scope of Work and additional compensation.

TABLE 1

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
STAGE 3 CYCLONED SAND TAILINGS EMBANKMENT (EL. 946)

COMMUNICATIONS LIST

M:\1162\12\REPORT\1\1-tbl1.xls]Sheet1

13-Oct-99

COMPANY AND NAME	TELEPHONE	FAX	e-mail
MOUNT POLLEY MINING CORPORATION			
Brian Kynoch (Imperial Metals)	(604) 669-8959	(604) 687-4030	briankynoch@imperialmetals.com
Eric LeNeve	(250) 790-2215	(250) 790-2268	eleneve@hotmail.com
Don Parsons	(250) 790-2215	(250) 790-2268	mpengin@bc.sympatico.ca
Greg Smyth	(250) 790-2215	(250) 790-2268	mpengin@bc.sympatico.ca
KNIGHT PIÉSOLD LTD.			
Ken Brouwer, Project Director	(604) 685-0543	(604) 685-0147	kbrouwer@knightpiesold.com
John Wilkinson, Project Manager	(604) 685-0543	(604) 685-0147	jwilkinson@knightpiesold.com
Leon Gous	(604) 685-0543	(604) 685-0147	lgous@knightpiesold.com

TABLE 2

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
STAGE 3 CYCLONED SAND TAILINGS EMBANKMENT (EL. 946)

SCALE OF FEES

Our scale of fees for engineering services is as follows:

Principals - JPH	\$145.00 per hour
Principals - BSB, KJB	\$125.00 per hour
Associates, Specialist Engineers	\$105.00 per hour
Senior Engineers	\$95.00 per hour
Project Engineers	\$80.00 per hour
Staff Engineers	\$65.00 per hour
Senior Technicians	\$75.00 per hour
Technicians and Drafting Personnel	\$60.00 per hour
Clerical	\$40.00 per hour

A daily rate of \$800.00 will be charged for site supervision by project engineers.

TABLE 3

MOUNT POLLEY MINING CORPORATION
MOUNT POLLY MINE
STAGE 3 CYCLONED SAND TAILINGS EMBANKMENT (EL. 946)

REIMBURSABLE EXPENSES

5051	Travel	@ cost		
	Own Vehicle	\$0.35/km		
5052	Expense sheets	@ cost		
5053	Communications			
	B.C. Telephone	@ cost + % of overhead costs		
	Facsimile	\$1.00/page (Sending & Receiving)		
	Federal Express	@ cost		
	Dwarf Courier	@ cost		
	Miscellaneous	@ cost		
5054	Printing			
	Outside Printing	@ cost		
	Xerox copies	\$0.20/copy		
	Colour copies	\$1.35 - 8.5" x 11"		
		\$2.70 - 11" x 17"		
	Lazer Printing	\$0.20/copy		
	Diazo Printing	\$1.00 - paper		
		\$2.00 - Vellum		
		\$5-15.00 - Mylar		
	Electrostatic Plotter			
		\$4.00 B-Size		
		\$6.00 D-Size		
		\$12.00 E-Size		
	Color Plotter	8½x11	11x17	D-Size
		Bond	\$ 3.00	\$10.00
		Film	\$10.00	\$15.00
5055	Miscellaneous	@ cost		
	Computer Disk	\$3.00/disk		
5056	Sub-Consultants	@ cost		

All of the above expenses charged at above rate + 10%

Computer (AutoCAD, Eng. Software) \$30.00 per hour



TABLE 3 (cont)

MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE
STAGE 3 CYCLONED SAND TAILINGS EMBANKMENT (EL. 946)

EQUIPMENT CHARGE-OUT RATES

Item	Cost	Rate
Lab AEP Test Eqpt	\$800	\$50 per week
Field AEP Test Eqpt	\$3000	\$100 per week
Theodolite -Wild T1	\$6900	\$150 per week
Level - Sokkisha B2	\$1175	\$50 per week
Water Level Probe	\$850	\$25 per week
Point Load Tester	\$5000	\$150 per week
Packer Test Eqpt	\$10000	\$250 per week
Resistivity Testing Eqpt	-	\$1000 per month
Direct Shear Box Test Eqpt	-	\$150 per week
Grundfos Pump ¹	\$6500	\$200 per week ²
Site Office Computer	-	\$300 per month

- 1 - Grundfos Pump now owned by HKP.
2 - Plus Shipping. Minimum 1 week.
3 - One month = four weeks

Notes:

1. Please include these charge-out rates in Proposals as appropriate.
2. Use of smaller items, such as an altimeter, shall not normally be charged to the client.
3. Site Office Computers will be charged out at \$300 per month for general usage. A charge for computer time, @ \$30 per hour, applies for the use of engineering programs, MS Excel, MS Project, and AutoCAD.
4. Equipment usage (rental) is to be recorded on the EQUIPMENT RENTAL FORM. One form per project per invoicing period.

TABLE 4
MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

STAGE 3 CYCLONED SAND TAILINGS EMBANKMENT (EL. 946)
BUDGET SUMMARY

M:\11162\12\REPORT\1\1-tbl4-6.xls]summary

12/10/99 10:51

ITEM	TOTAL
Engineering Time Charges	\$113,680.00
Disbursements	\$41,261.00
TOTAL	\$154,941.00

Rev 0

Note: A preferred Client Adjustment of 5 percent will be applied to engineering time charges for all invoices paid within 30 days.



TABLE 5
MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

STAGE 3 CYCLONED SAND TAILINGS EMBANKMENT (EL. 946)
ESTIMATED ENGINEERING TIME CHARGES

M:\11162\12\REPORT\1\1-tbl4-6.xls]engineering time

12/10/99 10:51

TASK NO.	DESCRIPTION	Principal Hourly Rate	Senior Engineer \$125	Project Engineer \$95	Staff Engineer \$80	Technician \$65	Drafting \$60	Clerical \$40	Computer 20	Sub-Total Costs/
100	Project Management	25.0	35.0					5.0		6,650.00
200	Site Supervision									
201	Cyclone Sand Trial D/S Berm - Technical Support and Monitoring	20.0	60.0							8,200.00
202	CPT Investigations	5.0	10.0		50.0					4,825.00
300	Detailed Design of Cycloned Sand Embankment									
301	Comparison to Huckleberry Cycloned Sand Embankment	5.0	20.0				20.0		20.0	4,125.00
302	Design Cyclone Sand D/S Trial Berm	5.0	10.0		25.0		20.0		20.0	4,800.00
303	Develop Design Criteria and Update Filling Schedule	2.0	15.0		15.0		7.5	2.0	7.5	3,330.00
304	Compile CPT Data	1.0	15.0		15.0		30.0	2.0	30.0	5,005.00
305	Risk Assessment	5.0	30.0	15.0			15.0	2.0	15.0	5,955.00
306	Laboratory Testing	2.0	10.0	10.0			30.0		30.0	4,400.00
307	Update Embankment Staging	2.0	10.0	15.0			15.0		20.0	3,700.00
308	Embankment Settlement Analyses	5.0	15.0	25.0			7.5		25.0	5,000.00
309	Embankment Seepage Analyses			INCLUDED IN PREVIOUS BUDGET						0.00
310	Embankment Stability Analyses	5.0	15.0	15.0	25.0		20.0		20.0	6,475.00
311	Instrumentation and Monitoring Requirements	5.0	10.0		15.0		15.0	2.0	15.0	3,830.00
312	Develop Design Drawings	10.0	30.0	40.0		10.0	100.0		100.0	15,900.00
313	Closure and Reclamation Requirements	5.0	15.0	15.0			15.0		15.0	4,450.00
314	Develop Final Design Report	20.0	50.0	30.0	40.0		50.0	10.0	50.0	16,650.00
400	Update Operating, Maintenance and Surveillance Procedures	2.0	25.0	15.0			7.5	2.0	7.5	4,505.00
500	Miscellaneous Permitting Support	20.0	20.0	10.0			7.5	2.0	7.5	5,880.00
TOTAL MAN HOURS BY CATEGORY										
		144.0	395.0	190.0	185.0	10.0	360.0	27.0	382.5	
TOTAL MAN HOURS										1311.0
TOTAL COMPUTER HOURS										382.5
TOTAL ESTIMATED ENGINEERING TIME CHARGES										113,680.00

Notes:

1. Above unit rates are based on 1997 fee schedule.

Rev 0

TABLE 6
MOUNT POLLEY MINING CORPORATION
MOUNT POLLEY MINE

STAGE 3 CYCLONED SAND TAILINGS EMBANKMENT (EL. 946)
ESTIMATED DISBURSEMENTS

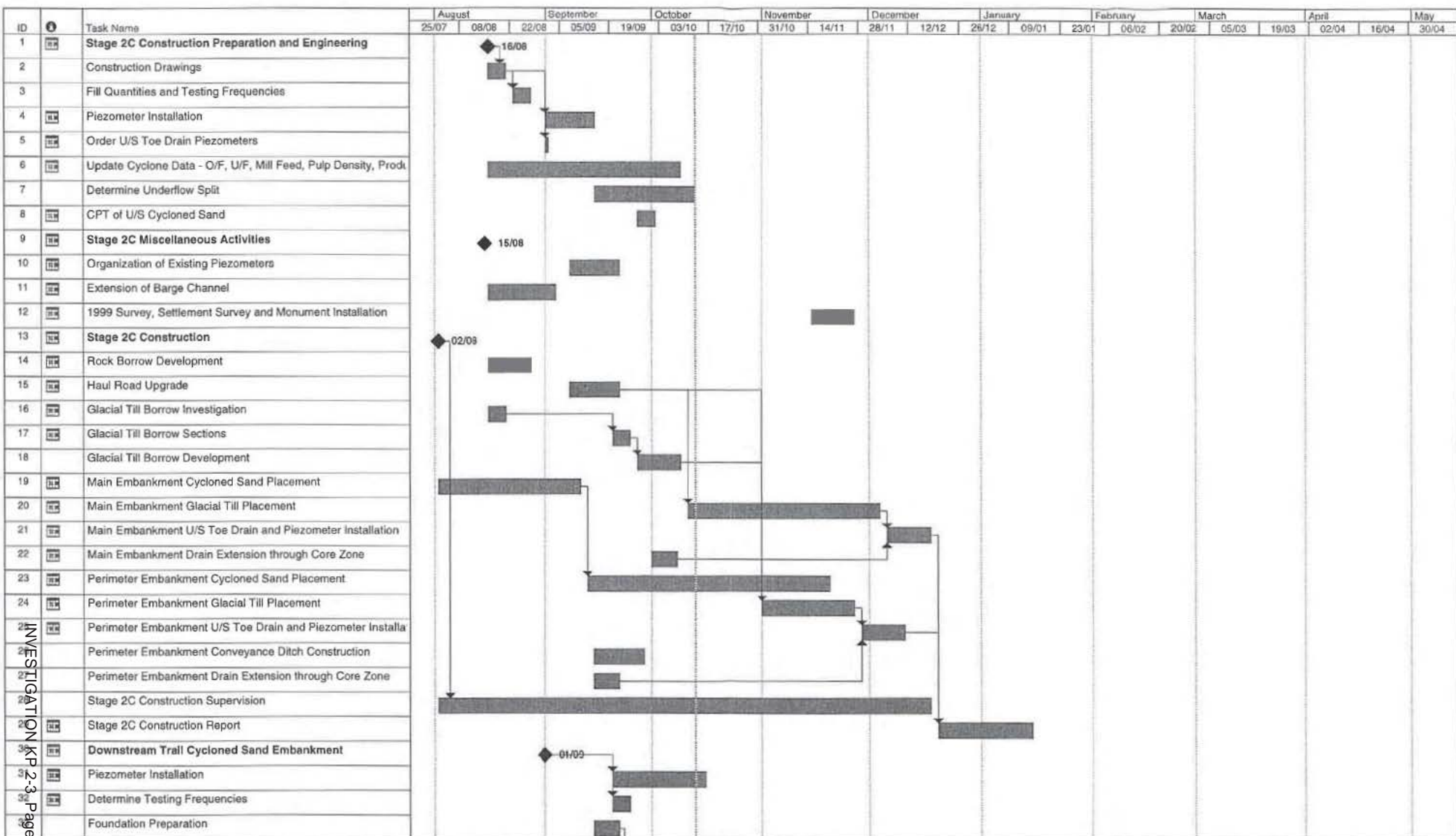
M:\11162\12\REPORT\1\1-b4-6.xls\disbursements

13/10/99 11:39

TASK NO.	TASK DESCRIPTION	COST ITEM	NUMBER	UNIT	UNIT RATE	AMOUNT	TOTAL +10 %
100	Project Management	Communications	1	L.S.	150.00	150.00	165.00
200	Site Supervision	Communications	1	L.S.	150.00	150.00	
		Airfare	2	L.S.	600.00	1,200.00	
		Document preparation and distribution	1	L.S.	500.00	500.00	
		Truck Rental	11	day	75.00	825.00	
		Room and Board	12	day	75.00	900.00	
		Nuclear Densometer	2	week	200.00	400.00	
		Piezometers	10	each	910.00	9,100.00	
		CPT Program	1	L.S.	11,600.00	11,600.00	
		Water Quality Tests	3	each	750.00	2,250.00	29,617.50
300	Detailed Design of Cycloned Sand Embankment						
		Communications	1	L.S.	150.00	150.00	
		Photos for report	1	L.S.	150.00	150.00	
		Specialist Laboratory Testing					
		- Triaxial shear tests with consolid'n	9	each	360.00	3,240.00	
		- Flexible wall permeameter	9	each	225.00	2,025.00	
		- Particle Size Distribution	6	each	120.00	720.00	
		Document preparation and distribution	1	L.S.	1,500.00	1,500.00	8,563.50
400	Update Operating, Maintenance and Surveillance Procedures	Communications	1	L.S.	150.00	150.00	
		Document preparation and distribution	1	L.S.	500.00	500.00	715.00
500	Miscellaneous Permitting Support	Communications	1	L.S.	150.00	150.00	
		Airfares	2	L.S.	600.00	1,200.00	
		Document preparation and distribution	1	L.S.	500.00	500.00	
		Truck Rental	2	day	75.00	150.00	2,200.00
TOTAL ESTIMATED DISBURSEMENTS							41,261.00

Notes: 1. 10% has been added to above disbursement charges.

Rev 0



Project: Polley Schedule
Date: Wed 13/10/99

Task

Split

Progress
Milestone

Summary

Rolled Up Task

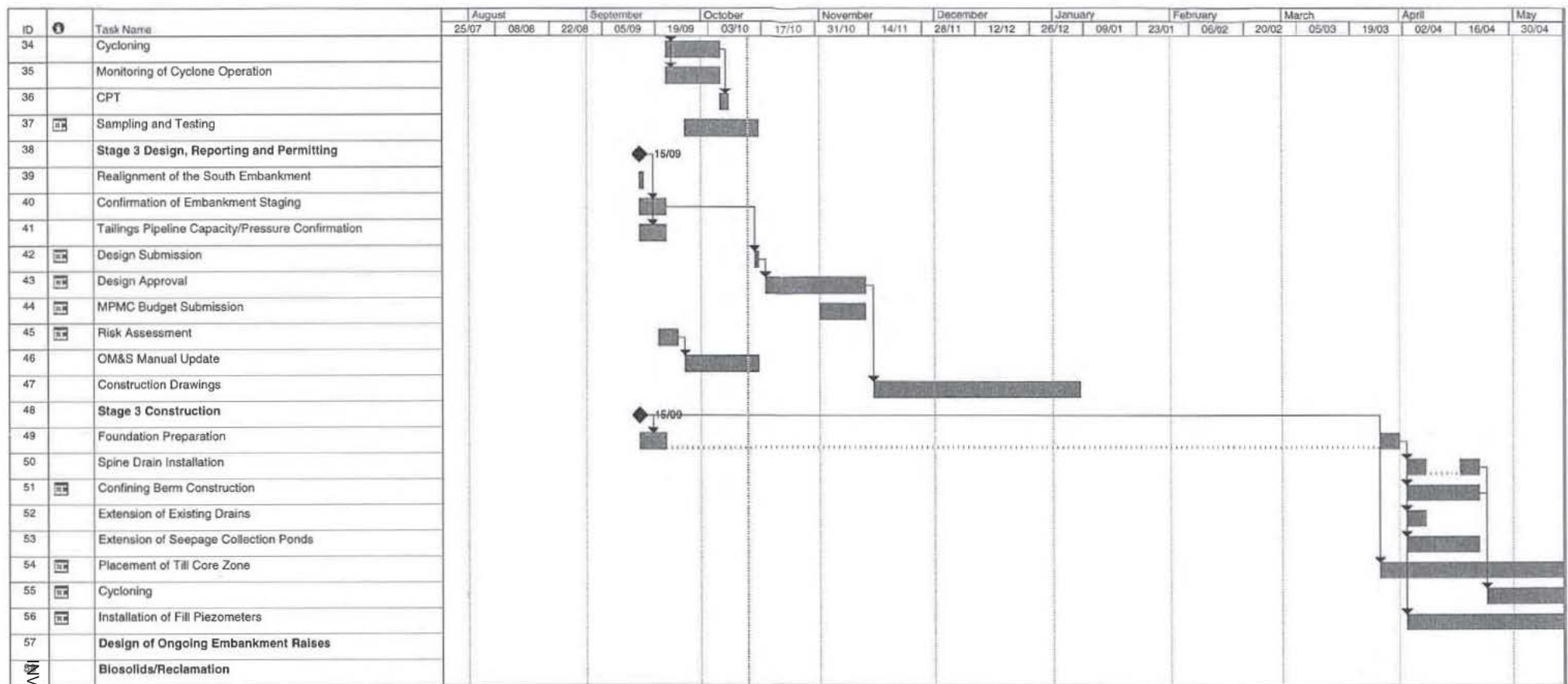
Rolled Up Split

Rolled Up Milestone

Rolled Up Progress

External Tasks

Project Summary



INVESTIGATION KP 2-3 Page 270 0500

Project: PolleySchedule
Date: Wed 13/10/99

Task
Split

Progress
Milestone

Summary
Rolled Up Task

Rolled Up Split
Rolled Up Milestone

Rolled Up Progress
External Tasks

Project Summary

APPENDIX A

**DRAFT TABLE OF CONTENTS
FOR THE FINAL REPORT**



MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

**REPORT ON CYCLONED SAND CONSTRUCTION
OF STAGE 3 AND ON-GOING STAGES OF THE
TAILINGS STORAGE FACILITY**

CONTENTS

SECTION 1.0	INTRODUCTION
	1.1 PROJECT DESCRIPTION
	1.2 TAILINGS STORAGE FACILITY
	1.3 SCOPE OF REPORT
SECTION 2.0	EXISTING EMBANKMENT DESIGN
	2.1 GENERAL
	2.2 DESIGN CRITERIA
	2.3 CYCLONED SAND TAILINGS FOR UPSTREAM ZONES
SECTION 3.0	CYCLONED SAND CONSTRUCTION
	3.1 DESIGN CONCEPT
	3.2 UPDATED DESIGN CRITERIA
	3.3 RESULTS OF DOWNSTREAM TRIAL BERM
	3.4 TAILINGS CHARACTERISTICS
	3.5 TAILINGS SUITABILITY
	3.5.1 General
	3.5.2 Index Properties
	3.5.3 Density, Moisture and Permeability
	3.5.4 Triaxial Compression and Consolidation
	3.5.5 Cyclone Underflow and Overflow Split
	3.6 CYCLONED SAND AVAILABILITY

SECTION 4.0	CYCLONED SAND DAM DESIGN
4.1	GENERAL
4.2	EMBANKMENT ZONES AND SPECIFICATIONS
4.3	DESIGN PARAMETERS
4.4	LONGITUDINAL AND FINGER DRAIN SPACING
4.5	STATIC STABILITY
4.5.1	Stage 3
4.5.2	On-Going Stages and Final
4.5.3	Post-Closure
4.6	SEISMIC STABILITY
4.7	EMBANKMENT AND FOUNDATION SEEPAGE
4.7.1	Stage 3
4.7.2	On-Going and Final
4.7.3	Post-Closure
4.7.4	Storm Water Management
4.8	DESIGN SUMMARY
SECTION 5.0	CYCLONED SAND DAM CONSTRUCTION
5.1	CONSTRUCTION SEQUENCING
5.2	FOUNDATION PREPARATION
5.3	DRAINAGE AND WATER MANAGEMENT
5.3.1	TOE DRAINS
5.3.2	FINGER DRAINS
5.3.3	SUMPS AND PONDS
5.3.4	SEEPAGE COLLECTION POND RECYCLE SYSTEM
5.4	DEVELOPMENT OF BORROW AREAS
5.5	CONSTRUCTION OF CONFINING BERMS
5.6	UPSTREAM AND DOWNSTREAM CYCLONING
5.7	CYCLONE PLACEMENT AND MOVEMENTS
5.8	CORE ZONE PLACEMENT

SECTION 6.0	TAILINGS DISTRIBUTION AND RECLAIM PIPEWORKS
6.1	TAILINGS PIPELINE AND HEADER
6.2	CYCLONE OPERATION
6.3	SPIGOTTING AND POINT DISCHARGE
6.4	RECLAIM PIPEWORKS AND OPERATION
SECTION 7.0	WATER MANAGEMENT
7.1	WATER QUALITY
7.2	UPDATED WATER BALANCE
7.3	STORM WATER MANAGEMENT
7.4	POST-CLOSURE WATER MANAGEMENT
SECTION 8.0	RISK ASSESSMENT
8.1	OPERATIONS, CLOSURE AND POST-CLOSURE
8.2	TAILINGS AND RECLAIM PIPEWORKS
8.3	WATER MANAGEMENT
8.4	EMBANKMENT PERFORMANCE AND STABILITY
8.5	LIKELIHOODS OF FAILURE
8.6	CONSEQUENCES OF FAILURE
8.7	RISK OF CYCLONED SAND OPERATION
SECTION 9.0	ON-GOING REQUIREMENTS
9.1	GENERAL
9.2	CONSTRUCTION MONITORING
9.3	MASS BALANCE UPDATES
9.4	GEOTECHNICAL INSTRUMENTATION AND REPORTING
9.5	WATER QUALITY MONITORING AND REPORTING
SECTION 10.0	CONSTRUCTION SCHEDULE
SECTION 11.0	CONCLUSIONS AND RECOMMENDATIONS

SECTION 12.0 REFERENCES

SECTION 13.0 CERTIFICATION

TABLES

FIGURES

DRAWINGS

APPENDICES

