BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

DELOITTE & TOUCHE INC.

2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENT REVIEW

VARIOUS FACILITIES AT FARO MINE, YUKON

PROJECT NO.: 0257-042-06
DATE: FEBRUARY 22, 2008

DISTRIBUTION LIST:

ANVIL RANGE FARO	2 COPIES
DELOITTE & TOUCHE TORONTO	8 COPIES
DELOITTE & TOUCHE CALGARY	1 COPY
GARTNER LEE – YELLOWKNIFE	1 COPY
GARTNER LEE – WHITEHORSE	6 COPIES
BGC CALGARY	2 COPIES
BGC VANCOUVER	1 COPY

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
200, 1121 Centre Street NW
Calgary, AB
T2E 7K6

Project No. 0257-042-06
February 22, 2008

Mr. Doug Sedgwick
Deloitte & Touche Inc., as Interim Receiver for Anvil Range Mining Corporation
Suite 1900, TD Centre
79 Wellington Street West
Toronto, ON
M5K 1B9

RE: 2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENT REVIEW VARIOUS MINE WASTE FACILITIES AT FARO MINE, YUKON

Dear Mr. Sedgwick:

Please find attached our final report on the Annual Geotechnical Evaluation and Instrument Review of various mine waste facilities at Faro Mine. This report has been sent to the distribution list shown on the front cover.

If there are any questions regarding this report, please contact the undersigned at your convenience.

Yours truly,
BGC Engineering Inc.
per:

Gerry Ferris, M.Sc., P.Eng.
Geotechnical Engineer

encl.: Final Report

GWF/sf

TABLE OF CONTENTS

1.0 Introduction 1
1.1 Scope of Services 1
1.2 General Background Relating to Inspection and Instrumentation 2
1.3 Additional Relevant Studies 3

2.0 2007 Monitoring Program 4
2.1 Introduction 4
2.2 Elevations within the Down Valley Project Area 4
2.3 2007 Water Management 5
2.4 Precipitation Information 5
2.5 Air Temperature Information 6
2.6 Measured Flow in Rose Creek Diversion Canal 6
2.7 Seepage Event in Faro Creek Diversion Channel 6

3.0 Inspection Conditions and Approach 7

4.0 Findings and Conclusions 8

5.0 Instrumentation, Monitoring and Annual Review 31
5.1 Instrumentation Readings 31
5.2 Routine Inspections by On-Site Personnel 32
5.2.1 Rose Creek Diversion Canal 32
5.2.2 Intermediate Dam 32
5.2.3 Cross Valley Dam 33
5.2.4 North Fork Rose Creek Flow-Through Causeway 33
5.2.5 Faro Creek Diversion Canal 33
5.2.6 Faro Waste Rock Dumps 34
5.2.7 Secondary Tailings Impoundments – East Leg 34
5.3 Annual Reviews 34

6.0 Closure 35

References 36

LIST OF TABLES

Table 1 Summary of Polishing Pond and Intermediate Pond Levels (2 pages)
Table 2 Total Monthly Precipitation (mm) at Faro Airport, Yukon
Table 3 Monthly Average Temperature (°C) at Faro Airport, Yukon
Table 4 Diversion Canal – Canal Dike – Piezometers
Table 5 Diversion Canal – Canal Dike – Thermistors
Table 6 Diversion Canal – Canal Dike – Slope Inclinometers
Table 7 Diversion Canal – Spoil Piles – Thermistors
Table 8 Diversion Canal – Spoil Piles – Slope Inclinometers
Table 9 Intermediate Dam – Piezometers
Table 10 Cross Valley Dam – 2007 Weir Flows
Table 11 Cross Valley Dam Seepage Flows – Weir X13 (1982-2007)
Table 12 Cross Valley Dam – Piezometers
Table 13 Cross Valley Dam – Thermistors
Table 14 Secondary Dam – Piezometers

LIST OF FIGURES

Figure 1 Site Location Plan
Figure 2 Down Valley Tailings Containment Instrument Locations - 1 of 2
Figure 3 Down Valley Tailings Containment Instrument Locations - 2 of 2
Figure 4 Cross Valley Dam Pond Elevations (2005 – 2007)
Figure 5 Intermediate Dam Pond Elevations (2005 – 2007)
Figure 6 Rose Creek Diversion Flow
Figure 7 Diversion Canal Dike Inspection Photos
Figure 8 Diversion Canal Dike Inspection Photos
Figure 9 Diversion Canal Dike Inspection Photos – Weir Sections
Figure 10 Canal Dike - Current Piezometric Conditions
Figure 11 Canal Dike/ Intermediate Pond – Hydraulic Connectivity
Figure 12 Spoil Pile Inspection Photos
Figure 13 North Valley Interceptor Ditch Inspection Photos
Figure 14 Intermediate Dam Inspection Photos
Figure 15 Intermediate Dam Inspection Photos
Figure 16 Intermediate Dam Inspection Photos
Figure 17 Intermediate Dam Inspection Photos
Figure 18 Section View of Intermediate Dam
Figure 19 Cross Valley Dam Inspection Photos
Figure 20 Cross Valley Dam Inspection Photos
Figure 21 Cross Valley Dam Inspection Photos
Figure 22 Cross Valley Dam 2007 Weir Flows
Figure 23 Cross Valley Dam Measured Flow Rates at X13

Figure 24 Section View of Cross Valley Dam
Figure 25 North Fork Rock Drain Inspection Photos
Figure 26 North Fork Rock Drain Inspection Photos
Figure 27 North Fork Rock Drain Measured Pond Elevation And Creek Discharge
Figure 28 North Fork Rock Drain Flow Through Performance
Figure 29 Faro Creek Diversion Channel Inspection Photos
Figure 30 Faro Creek Diversion Channel Inspection Photos
Figure 31 Faro Creek Diversion Channel 2007 Flow Rates
Figure 32 Faro Creek Diversion Channel Inspection Photos
Figure 33 Selected Waste Rock Dumps Inspection Photos
Figure 34 Secondary Dam Inspection Photos
Figure 35 Secondary Dam Inspection Photos
Figure 36 Secondary Dam – Current Piezometric Conditions
Figure 37 2008 Monitoring Schedule

LIST OF APPENDICES

Appendix I Faro Creek Seepage Event
Appendix II Site Visit Inspection Memos (June and September)
Appendix III Intermediate Dam Rip Rap repairs
Appendix IV Instrumentation Data Records and Graphs
Appendix V Faro Creek Instrument Installation

LIMITATIONS OF REPORT

BGC Engineering Inc. (BGC) prepared this report for the account of Deloitte and Touche Inc., as interim receiver for Anvil Range Mining Corporation. The material in it reflects the judgment of BGC staff in light of the information available to BGC at the time of report preparation. Any use which a third party makes of this report, or any reliance on decisions to be based on it are the responsibility of such third parties. BGC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

As a mutual protection to our client, the public, and ourselves, all reports and drawings are submitted for the confidential information of our client for a specific project. Authorization for any use and/or publication of this report or any data, statements, conclusions or abstracts from or regarding our reports and drawings, through any form of print or electronic media, including without limitation, posting or reproduction of same on any website, is reserved pending BGC's written approval. If this report is issued in an electronic format, an original paper copy is on file at BGC Engineering Inc. and that copy is the primary reference with precedence over any electronic copy of the document, or any extracts from our documents published by others.

1.0 INTRODUCTION

1.1 Scope of Services

BGC Engineering Inc. (BGC) provided a proposal (No. 07-031) for the annual geotechnical evaluation and instrumentation review work at Faro Mine, dated April 10, 2007, to Mr. Doug Sedgwick of Deloitte & Touche Inc. (Deloitte), Interim Receiver for Anvil Range Mining Corporation. The noted scope of work comprised the following components:

a) Field geotechnical inspection, review of relevant instrumentation data and preparation of maintenance recommendations concerning the following structures:
   - Cross Valley Dam and emergency spillway;
   - Intermediate Dam and emergency spillway;
   - Rose Creek Diversion Channel (dike crest, top of backslope and toe of slope);
   - North Valley Wall Interceptor Ditch;
   - North-Fork Rose Creek flow-through rock drain;
   - Selected portions of the Faro Waste Rock dumps;
   - Secondary Tailings Impoundment; and
   - Faro Creek Diversion Channel above the Faro Pit.

b) Synthesis and interpretation of field instrumentation data (collected by site staff).
c) June and September site visits to inspect conditions.
d) Preparation and presentation of site staff geotechnical training seminar.
e) Direct the installation of new flow monitoring locations in the Faro Creek Diversion Channel.
f) Preparation of a compilation report that provides interpretation and recommendations resulting from the instrumentation data and field inspections. The report provides a compendium of all relevant instrumentation data and plots.

This annual inspection report does not include the Fresh Water Supply (FWS) Dam Breach Project. As detailed in Section 1.2, this dam was breached in 2003 and inspection of the breach and channel works constructed is reported under a separate water licence and inspection report.

Two separate site inspections visits were performed in 2007; in June and September. The purpose of the June inspection was to examine site conditions of the major structures immediately following the spring freshet. The September inspection coincided with the timing of the annual inspection visits that have been performed for over 20 years. The structures listed above were assessed.

In May 2007, a “seepage event” occurred within the north-south leg of the Faro Creek Diversion Canal. Two additional site visits, in addition to the visits noted in June and September, were performed to address the concerns related to the seepage. The first site visit occurred immediately following discovery of the seepage and the second was in early September when remedial construction was performed. During these two additional site visits, some of the other structures were visited by BGC staff.

In addition to the annual inspection and assessment work, BGC was responsible for the preparation of a training seminar for site staff. During the September inspection, a seminar was given to provide site staff with continued training related to surveying.

1.2 General Background Relating to Inspection and Instrumentation

Golder Geotechnical Consultants provided design recommendations for the Down Valley Tailings Disposal Project (Golder 1980). Following the subsequent construction of the facilities (Golder 1982), an extensive geotechnical monitoring program was initiated and is continuing to-date. Golder Associates was responsible for the annual inspection and instrumentation review of the Down Valley Tailings project between 1981 and 1999. Beginning in 2000, BGC has conducted the annual geotechnical inspection and instrumentation review duties.

The report provided herein presents an assessment of the monitoring data collected in 2007. Monitoring data from piezometers, slope inclinometers, thermistors and seepage weirs is collected by site staff. The data is forwarded to BGC for review and inclusion in this report. In addition to reviewing the instrumentation data, visual inspections of the various facilities were undertaken by BGC personnel. This report compiles and reviews the instrumentation and inspection components in order to assess the physical performance of the noted structures.

As noted earlier, the FWS Dam was breached in November/December 2003, in accordance with the terms and conditions provide in the Yukon Water Board Licence Number QZ03-058. This licence is in effect until December 31, 2008 and provides details on reporting, effluent quality standards, monitoring and surveillance required for this specific project. The requirements provided in that licence are supplemental to those provided in Water Licence QZ03-059 which are applicable to the Faro Site.

The following components of Faro Mine are included within the present report, and are shown in Figures 1, 2 and 3:

- **The Rose Creek Diversion Canal –** The Canal Dike was built as part of the former Down Valley Tailings Project in 1980-81, it was constructed as an expansion of the existing canal which diverted water around the Secondary Impoundment. The Canal Dike separates the diversion canal from the Polishing Pond, the Intermediate Dam pond and tailings deposit. Structures associated with the Rose Creek Diversion Canal include the Canal Dike, the Spoil Piles and the Back Slope.
- **The Intermediate Dam –** The Intermediate Dam was designed to retain tailings solids, supernatant water and run-off water. It was built as part of the Down Valley Tailings Project in 1980-81, and underwent crest raisings in 1988, 1989 and 1991.
- **The Cross Valley Dam –** The Cross Valley Dam was designed to have capacity for 60-day retention of seepage/discharge water from the Intermediate Dam. It was originally used as a polishing pond and later for water treatment residue retention. Built as part of the former Down Valley Tailings Project, it was constructed in 1980-81.

- **North-Fork Rose Creek Flow-Through Causeway ("the Rock Drain")** - The causeway was built of waste rock in 1987. The causeway was advanced by dumping waste rock from the causeway grade to provide a zone of preferentially larger particles in the lower portion of the fill. This zone conveys creek flows through the structure; the driving head being provided by a small pond of water on the upstream side of the causeway.
- **Faro Creek Diversion Canal and East Wall of Faro Pit** – Faro Creek was diverted around the top of the Faro Pit through the construction of a diversion channel, in 1967/68. The stability of the east wall of the Faro pit has been a concern throughout the lifetime of the pit operation. A number of structural discontinuities within the east pit wall, coupled with seepage from the Faro Creek diversion canal along the top of this pit wall, contribute to the slope instability that has occurred along this pit wall.
- **Faro Waste Rock Dumps** – The Waste Rock dumps were built throughout the operating life of the Faro Pit. These dumps were generally constructed by end dumping and spreading from the final bench elevation of the dump. Portions of the Faro Waste Rock Dumps are adjacent to the North Fork of Rose Creek. Generally, the physical stability of waste dumps are of concern during construction and the first few years following construction. However, given their location adjacent to a creek, these portions of the waste dumps are reviewed on a two-year cycle.
- **Secondary Tailings Impoundment** – Built in 1974 to accommodate expanding tailings storage requirements. The stability of the eastern portion (east of the Diversion Dam) of the secondary tailings component is a concern since it is retaining tailings from the upper section of the Rose Creek Diversion Canal.

1.3 Additional Relevant Studies

In addition to instrumentation monitoring and visual inspections, Deloitte and the Faro Mine Closure Planning Office (FMCPO) have completed a number of assessment studies relevant to structures and facilities at Faro Mine that are discussed in this annual report. These additional studies are documented in the following reports:

1. BGC (2003) wrote an Emergency Preparedness Plan (EPP) for potential failure of the dams at the Faro Mine.
2. BGC (2007a), with input from SRK, prepared an Operations, Maintenance and Surveillance Manual (OMS) for the dams at the Faro Mine site (including Little Creek Dam near the Vangorda/Grum mining area).
3. Klohn (2002) performed the 2002 dam safety review for the Intermediate and Cross Valley Dams and channels at the Faro Mine site. A new dam safety review was commissioned in 2007. This review was performed by Klohn Crippen Berger Ltd. but the report is currently under preparation and is not available at this time.
4. Golder (2007) reported on the performance of the stability of the soil slope between the Faro Pit and the Faro Creek Diversion Canal.
5. BGC (2007b, c) provided details on the seepage event at the Faro Creek Diversion Canal and recommended construction activities be performed at the seepage site.

6. BGC (2007d) reported the results of a risk assessment meeting held in relation to the Faro Creek Diversion Canal seepage event. This meeting was attended by BGC, Deloitte, Anvil Range and FMCPO personnel. The risks presented by the Faro Creek Diversion were evaluated and an action plan created to address the risks.
7. BGC (2007e) provided an as-built summary of the construction activities related to the repairs completed at the Faro Creek Diversion in September 2007.

These reports, especially the 2007 Dam Safety Review once completed, should be reviewed in conjunction with the assessment provided herein. Each report provides conclusions and recommendations that are relevant to structures and facilities at Faro Mine and the Down Valley Tailings Project.

2.0 2007 MONITORING PROGRAM

2.1 Introduction

Historically, the monitoring program has been comprised of a specific schedule for reading the instrumentation, which depended on the type of instrument, its location and the performance trend indicated by the accumulated data. In those areas where good performance of the structures was demonstrated over time, the frequency of readings was reduced for reasons of economy or irrelevance of additional data, or because the installations became non-functional. Conversely, there have been some instances where instrumentation and visual observation justified more frequent readings and installation of additional instrumentation. A recommended instrumentation monitoring schedule for 2007 was provided as Figure 35 of the 2006 Annual Geotechnical Inspection (BGC 2007f).

Instruments in the Rose Creek Diversion Canal (canal dike and spoil piles), Intermediate Dam, Cross Valley Dam, and Secondary Tailings Impoundment Dam were scheduled for monitoring in May, June and September. The proposed schedule was followed with minor changes. All of the instruments within the down valley tailings area monitored as part of this evaluation are shown in Figures 2 and 3.

As a complement to the instrumentation data obtained, various components of the Faro Mine were visually inspected by BGC personnel during the periods between June 13 to 14 and September 24 to 26, 2007. Details of the visual inspection are discussed in Section 4.0.

2.2 Elevations within the Down Valley Project Area

Elevations within the Down Valley project were originally documented with respect to the Down Valley Project Datum (DVPD). The DVPD is 32.3 m above the mean sea level datum (m amsl), thus to convert elevation from dvpd to amsl 32.2 m needs to be subtracted from the original elevation. The Interim Receiver has completed a program to present information concerning the facilities in terms of metres above mean sea level (or a geodetic datum) rather than in DVPD or mine datum.

All elevations documented in this report concerning structures and instrumentation are reported with respect to geodetic datum. An elevation survey of all instruments at the Cross Valley and Intermediate Dams was performed in 2004, allowing the data to be presented in terms of the geodetic datum. Surveys of crest and instrument collar elevations for the Diversion Canal (Canal Dike, Back Slope, and Spoil Piles) and the Secondary Tailings Dam were performed in 2005. These surveys have allowed all the instrumentation data collected at the Faro Mine to be presented in terms of the geodetic datum.

2.3 2007 Water Management

Water pumped from the Faro Pit passes through the mill water treatment plant and then flows to a dissipater chamber located at the toe of the Intermediate Dam, discharging to the Cross Valley Pond ("the Polishing Pond"). Water is pumped from the Intermediate Dam pond to the mill water treatment plant, following treatment this water is discharged with the Faro Pit water at the toe of the Intermediate Dam. Occasionally decant siphons are used to convey water from the Intermediate Pond over the Intermediate Dam into the Cross Valley Pond. Water from the Cross Valley pond is then discharged to the environment over the Cross Valley Dam by siphon pipes.

The Intermediate and Cross Valley Pond water levels are measured with respect to a geodetic datum using either staff gauge readings or direct survey from a local benchmark. Figures 4 and 5 provide a summary of the Cross Valley Pond and Intermediate Pond water levels throughout the year. Table 1 contains the 2007 water level data from the Intermediate and Cross Valley Ponds in tabular format. The water level information is used to aid in the interpretation of the instrumentation response in the following sections.

In 2007, similar to the past few years, the pond levels in both the Intermediate Pond and Cross Valley Pond were kept low since the water quality was suitable for discharge. The Cross Valley Pond fluctuated from a high of 1029.65 m on April 2 down to a low of 1027.55 m on September 17. The Intermediate Pond level ranged from a high of approximately 1046.92 m on December 6 to a low of 1046.03 m on July 9.

2.4 Precipitation Information

Yearly climatic conditions can significantly affect the performance of water retaining and water conveying earth structures. Table 2 provides a summary, on a month-by-month basis, of the total precipitation at the Faro Airport from 1978 to 2007. At the bottom of the table, the minimum, mean and maximum monthly precipitation values are also provided. The Faro Airport station experienced numerous problems in 2007 and data was available for only four months. The average annual precipitation at the Faro Airport is 307 mm.

2.5 Air Temperature Information

Yearly climatic conditions can significantly affect the performance of water retaining and water conveying earth structures. Table 3 provides a summary, on a month-by-month basis, of the air temperature at the Faro Airport from 1977 to 2007. At the bottom of the table, the minimum, mean and maximum values are provided. In 2007, the average monthly temperature was slightly lower than the average. The average monthly temperature in 2007 was -2.5°C or 0.4°C cooler than the mean annual value -2.1°C. Of particular importance was the record cold November of 2006 (-26°C as compared to the average of -14.4°C) which lead to early ice formation in all the canals on site and greater than normal frost penetration at the site.

2.6 Measured Flow in Rose Creek Diversion Canal

The amount of flow within the Rose Creek Diversion Canal (RCDC) affects the performance of the diversion structure and the expected results in the instruments used to monitor the performance of the Canal Dike. Figure 6 provides a summary of the measured daily flows near the inlet of the Rose Creek Diversion Canal. The flows are determined based on a daily reading (normally early morning) of a staff gauge located about 50 m downstream of the inlet to the Canal. The staff gauge readings are converted to flow based on a rating curve. The peak flow measured in 2007 was 11.3 m^3/sec. Also included in Figure 6 is a summary plot of the peak daily flows measured at this location in the last couple of years (since monitoring began), plus a data point from 1975 (Sigma 1975). The 2007 peak flow value is lower than the average peak flow of 18 m^3/sec.

2.7 Seepage Event in Faro Creek Diversion Channel

In May 2007 site staff, as part of their visual monitoring activities, noted the occurrence of significant seepage in the Faro Creek Diversion Canal (FCDC). BGC personnel were notified and performed an inspection of the seepage location. Mr. Jim Cassie, P.Eng. of BGC came to the site, reviewed the previous observations and measurements collected by site staff as well as the emergency measures instituted. Additionally, recommendations were made for the temporary repair of the affected portion of the canal (BGC 2007b). Following this initial field assessment a review of the collected information from the site visit, temperatures conditions, size of the channel (based on survey work performed by site staff) and preliminary calculations for channel capacity was performed and reported. This supplementary assessment memo (BGC 2007c) provided recommendations for further engineering assessments, recommended performing a risk assessment of the canal, and preliminary engineering design information for the longer term repair to the FCDC.

A Failure Modes and Effects Analysis (FMEA) risk assessment was conducted on the FCDC. The FMEA analysis was performed by an expert group which reviewed the known information related to the FCDC and consisted of personnel from BGC, Deloitte, ARMC and the FMCPO. This risk assessment identified eight moderately high risks (BGC 2007d). For each of these risks, a program of either further assessment, quantification or construction activities were prescribed.

In September of 2007 BGC personnel, Mr. Gerry Ferris and Mr. Brad Russell, were on site to monitor the construction of remedial repairs that were recommended earlier in the year (BGC 2007c). The construction was completed by site staff and equipment. Prior to BGC's arrival on site, all materials were ordered, brought to the construction site and prepared by site staff. Immediately prior to construction activities, the FCDC was diverted using a system of pumps and pipes. An as-built report was prepared to document the construction completed (BGC 2007e). The construction was completed immediately prior to the onset of winter conditions at the site.

Following these activities at the site, BGC prepared a memorandum which summarized the outstanding recommendations for the FCDC, a copy of this memo is included in Appendix I. Also included in Appendix I is a letter from Deloitte which outlines the recommended work to be conducted in 2008, based on the earlier BGC memorandum and other factors.

3.0 INSPECTION CONDITIONS AND APPROACH

Mr. Jim Cassie, P.Eng., from BGC undertook the two site inspections of the selected structures. Mr. Cassie was on site in June and then again in September to perform the annual inspection services.

Each of the selected structures was inspected in a walking tour. Pertinent observations concerning both condition and seepage (or lack thereof) were recorded by camera and dictaphone.

In general, during the June inspections, the site appeared in good condition with no major concerns noted, only minor maintenance was recommended. The findings were reviewed verbally with Mr. Dana Haggar, Site Manager, before BGC personnel left site. A summary memo pertaining to the conditions and maintenance items was prepared for Deloitte; a copy is attached in Appendix II.

During the September inspection, the inspected facilities appeared in satisfactory condition and the recommendations made for some repairs were related to minor maintenance and monitoring. Repairs to the Intermediate Dam riprap, recommended as part of the 2006 Annual inspection and clarified in 2007 (See Appendix III) was completed by the time of the September inspection. The result of this inspection and the minor maintenance items were reviewed verbally with Mr. Haggar, Site Manager and a summary was left for Deloitte; this is also attached in Appendix II.

4.0 FINDINGS AND CONCLUSIONS

The results of the inspections of each of the structures are presented on the following pages in standardized format, complemented by a selection of site photographs. Please refer to Figure 1 for the general location of each structure and to Figures 2 and 3 for the locations of individual instruments within the Down Valley Project Area. Specific maintenance requirements are documented on the individual structure summary sheets and in the summary memos provided in Appendix II. Instrumentation data reviewed on the summary sheets are attached in Appendix IV.

In general, the structures appeared in good condition and the instruments appeared in good working condition.

There are a total of 87 active subsurface instruments at the Faro Mine site, which includes 64 piezometers, 12 thermistors, and 11 slope inclinometers. In addition to these subsurface instruments, staff gauges and data loggers are used to monitor the flow in various canal reaches. In total 7 staff gauges and 4 data loggers are in current use. Site staff also perform water elevation surveys of the different pond elevations at the Intermediate and Cross Valley Ponds as well as at the North Fork Rock Drain.

Visual monitoring and reading of instrumentation (as recommended) should be continued and the instrumentation data immediately conveyed to BGC for review. Should any atypical or deteriorating conditions be observed or recorded, BGC should be contacted immediately for comment. Protocols for anomalous readings were reviewed in the Emergency Action Plan (EAP) presented in BGC (2003).

ROSE CREEK DIVERSION CANAL (RCDC) – CANAL DIKE

LOCATION: Borders the southern edge of the tailings impoundments (see Figures 2 and 3). The Canal Dike is considered to start at the 1981 Diversion Dam.

FUNCTION: The Canal Dike separates the diversion canal from the Polishing Pond, the Intermediate Dam pond and tailings deposit. Figures 7 through 9 provide photographs of the RCDC Canal Dike and Backslope.

LENGTH: +/- 3,800 m

MAX HEIGHT: +/- 4 m above downstream toe/native ground.

CREST ELEVATION: 1063.1 m at the start of the dike, grading downwards at 0.3% to the start of the upper weirs, where the crest elevation is 1052.4 m. The dike then grades at 4.6% through the weir sections to an elevation of 1024.9 m. After the weir section, the dike grades at 2.2% to a final elevation of 1014.8 m.

CREST WIDTH AND CONDITION: +/- 5 m wide; No signs of cracking or settlement were noted on the Canal Dike crest.

FLOW Figure 6 presents the flow quantity (measured at a staff gauge once per day) in the Rose Creek Diversion during 2007. The measured maximum daily flow in 2007 occurred in early June and was 11.3 m^3/sec, as compared to the average peak of 18 m^3/s.

RIPRAP: The rip rap is in satisfactory condition.

WEIRS: Central boulders have been displaced downstream slightly, Figure 9. Overall, the weir sections appeared in satisfactory condition.

INSTRUMENTATION: Readings of the Canal Dike instruments for 2007 were obtained in May and September. Tabulated data and plotted records are presented in Appendix IV and summarised in Tables 4, 5 and 6.

PIEZOMETERS*:* The observed piezometric pressures generally reflect the anticipated conditions. Figure 10 provides a longitudinal section of the piezometric conditions observed within the canal dike observed during 2007. Additional observations with regards to the 2007 Canal Dike piezometric monitoring data include the following:

ROSE CREEK DIVERSION CANAL (RCDC) – CANAL DIKE CONTINUED

- Data collected from piezometers CD-21, CD-26 and BGC05-06 indicates a downward hydraulic gradient, and low pore pressures at depth indicate that the subsurface is essentially free draining. These pressures are lower than the adjacent water levels in the Intermediated Pond.
- Downstream of the Intermediate Dam, Piezometer CD-26 at Station 2+600 indicates essentially free drainage at depth. The lower piezometer, although some 70 m southwest of the pond shoreline, indicates a water level approximately 12.5 m above the full supply elevation of the polishing pond (1030.33 m). This is thought to be due to the influence of the upstream reservoir, the water level in the diversion canal and hillside seepage.
- Data collected from CD-13 and -15 indicates that a weak upward hydraulic gradient exists at these locations. The upward hydraulic gradient at CD-15 has been consistent since 2002.

During 2007, the water level in the tailings pond retained by the Intermediate Dam was about 1 m below full supply in the first part of the year, then was lowered from the beginning of May till the end of June, with a gradual increase during the rest of the year. The average pond level for 2007 is 1046.5 m.

The Canal Dike crest elevation opposite the south abutment of the Intermediate Dam is approximately 1052.9 m. The invert of the 0.6 m deep pilot channel (of the diversion canal) is at approximately 1048.9 m. Fall flows typically just inundate the bench adjacent to the pilot channel, suggesting a diversion canal water surface elevation of about 1049.6 to 1049.7 m, i.e., an elevation approximately two and a half metres above the level of the tailings pond at the Intermediate Dam. The gradient of the Diversion Canal is 0.19%. The tails beach limit, when the pond is at its full supply level, is about 1100 m upstream of the Intermediate Dam. In addition, higher spring and summer flows in the canal will produce a higher driving head for potential seepage.

Based on the above, the difference in elevation between the surface of the water in the Diversion Canal and the base level (water or tailings) upstream of the Intermediate Dam ranges from about 2 m at the Intermediate Dam to approximately 4 m at the beach limit. Upstream of the beach limit, the difference in elevation is about 4 m.

ROSE CREEK DIVERSION CANAL (RCDC) – CANAL DIKE CONTINUED

Under these conditions, and a uniform head loss between the Diversion Canal and the tailings pond, piezometric levels recorded by piezometers installed in the Canal Dike should range from about 1049.2 m just upstream of the Intermediate Dam (Sta 2+500), to about 1051.2 m at the limit of the tailings beach (Sta 1+400). The geometry and piezometric assumptions reviewed here are graphically displayed on Figure 11. In general, the piezometer readings are within the expected range, however as can be seen on Figure 10, a few exceptions occur, particularly for deep piezometers located near the Intermediate Dam. Those piezometers do not appear to be part of the same groundwater regime, but more influenced by hillside drainage to the Polishing Pond. All of the piezometer readings are within the expected historical range.

THERMISTORS: The data continues to indicate a slight warming trend at depth at thermistor locations CD-10, CD-21, CD-26 and BGC01-02. Generally colder temperatures were noted in most thermistors, related to the extreme cold of November 2006. In general, readings from the thermistors in 2007 were slightly colder than the range measured in previous years.

- At thermistor location CD-15, the cooling trend at 10 m depth measured since 1999 reversed and warming was measured. Permafrost still exists at 10 m depth.
- A thermistor string was installed in Borehole BGC01-02 to verify the geothermal conditions indicated by installation 88-11. The data collected in 2007 indicates that permafrost no longer exists within 13 m of the ground surface.
- BGC05-04 and 07 were installed in 2005 but have not been read due to an incompatibility of the switchbox. This should be repaired in 2008.

SLOPE INCLINOMETERS: The slope inclinometer indicated only minor movements in 2007. The majority of the movement, when encountered, was surficial and appeared to be creep. Many instruments showed past evidence of settlement.

ROSE CREEK DIVERSION CANAL (RCDC) – CANAL DIKE CONTINUED

It appears that minor shear movements are occurring between depths of 4 and 5 m at CD-10. Continuing monitoring will be need at this location, along with a detailed visual inspection of the surface area by the geotechnical engineers during 2008.

In addition to these general comments, the plots for slope inclinometer at BGC01-01 shows significant variation to other installations. When installed, this casing was 14 m deep (below the ground) but can be only measured in its upper 10 m in 2007. This is likely due to freezing at depth and gradual build up of ice in the casing. This has made on going comparison difficult. This SI should no longer be read as it is not providing useful information. With the 2005 installations near this location, the SI no longer should be read.

MAINTENANCE RECOMMENDATIONS:

As part of the on-going maintenance, the crest of the Canal Dike should be graded each September or October after the annual inspection to cover areas where cracks and potholes have developed. The purpose of this treatment is to prevent ingress of surface run-off water that may be concentrated in the settled areas, potentially reducing stability. Blading should be used to accomplish this work. Care must be taken not to disturb the existing instrumentation that has been installed to monitor performance of the dike.

BGC05-04 and 07 were installed in 2005 but have not been read due to an incompatibility of the switchbox. This should be repaired in 2008.

Given the extreme cold conditions that were encountered in November of 2006, ice formed on the channel bottom and remained throughout the year. This resulted in colder than average conditions within the foundation. It is recommended that a series of staff gauges be installed within the Rose Creek Diversion Canal to help quantify locations of seepage loss, especially related to the seepage through the spoil pile.

CONCLUSIONS:

The majority of the permafrost that was originally in the Canal Dike has degraded beyond the depth of instrumentation. Given the above summary of monitoring results, it is recommended that selected instruments be monitored in 2008. The select instruments are located in the area of 2004 dike crest raise and the piezometers throughout the dike crest. Monitoring of all working instruments should be moved to a two year cycle outside of this 1 km zone.

RCDC – SPOIL PILES

LOCATION: Downslope of the diversion canal dike, on the southern edge of the tailings impoundments (see Figures 2 and 3).

FUNCTION: The construction waste of the diversion canal dike formed the spoil piles. Figure 12 provides photographs of the toe area of the Spoil Pile adjacent to the Cross Valley Pond.

LENGTH: Discontinuous over the approximate 3,800 m length of the Canal Dike.

MAX HEIGHT: Variable heights, ranging from approximately 1 m to 8 m above downstream toe/native ground.

SEEPAGE: Increased seepage quantity and sloughing occurring at the toe of one portion of the spoil piles, located between the Cross Valley and Intermediate Dams. Seepage and related sloughing is caused by very low polishing pond level. This sloughing has been noted since 2005 and appears to be worsening since that time. Significantly more seepage was noted in 2008 at the toe of the spoil pile within the polishing pond as compared to past observations. This area should be visually monitored for deteriorating conditions and repaired as necessary.

It is recommended that two piezometers be installed through the spoil pile to record the piezometric conditions within this known seepage area.

INSTRUMENTATION: Readings for the spoil pile instruments for 2007 were obtained in June and October. Tabulated data and plotted records are presented in Appendix IV and summarised in Tables 7 and 8.

THERMISTORS*:* Thermistor SP-2 and SP-3 indicates that there is no longer any permafrost above a depth of 9 m at this location. A slight warming trend is apparent in the data.

SLOPE INDICATORS: Inclinometer SP-2 showed some minor downslope creep movement in 2007. The spoil pile has settled in the vicinity of Station 1+530, based on the distinctive shape of the deflection versus depth curves for data obtained from SP-2.

MAINTENANCE RECOMMENDATIONS: Increased seepage quantity and sloughing occurring at the toe of the spoil piles, located between the Cross Valley and Intermediate Dams, likely caused by very low polishing pond levels. Visually monitor sloughing and retrogression for the short term and undertake rehabilitation if the retrogression becomes worse.

RCDC – SPOIL PILES CONTINUED

CONCLUSIONS:

Continued monitoring is required along the toe of the Spoil Piles between the two dams. Based on visual assessments it appears that the seepage in this area is increasing. The seepage loss from the canal can be approximated from the proposed staff gauges recommended for the Rose Creek Diversion. In addition, two piezometers are recommended to be installed in the spoil pile above the seepage area to monitor the pressures in the slope.

The spoil pile is experiencing some on-going creep movements near SP-2, which are located downslope from areas of the canal dike that have moved in the past. There is no measured permafrost remaining in the foundations of the spoil piles. Monitoring of the spoil pile instruments currently is on a two year cycle; this schedule should be continued. The newly recommended piezometers should be monitored on a twice yearly basis.

RCDC – BACKSLOPE

LOCATION: Upslope of the Canal Dike, on the southern edge of the tailings impoundments (see Figures 2 and 3).

FUNCTION: Forms part of the canal excavation above the elevation at which water will flow. The Canal Backslope was constructed when the Canal was excavated. Figures 7 to 8 provide photographs of the Canal Backslope.

LENGTH: +/- 3,800 m, the entire length of the Canal Dike

INSTRUMENTATION: No readings were collected from the backslope instrumentation during 2007, as per the recommendations in the 2006 Annual report (BGC 2007f).

PIEZOMETERS: not read in 2007

THERMISTORS*:* not read in 2007

SLOPE INDICATORS*:* Not read in 2007.

OBSERVATIONS: Approx. 2H:1V slope and in good condition with no signs of settlement. Previously noticed sloughs (with small headscarps and cracks) at two locations on the backslope appear inactive. The sloughs are located approximately 30 m east of CD-19 and one directly south of the first weir. These sloughs likely resulted from surficial saturation of the backslope materials.

MAINTENANCE RECOMMENDATIONS : Monitor sloughing on backslope and assess for deteriorating conditions.

CONCLUSIONS: The Canal Backslope is performing satisfactorily with some minor occurrences of local sloughing within the granular material and erosion.

The Canal Backslope is monitored every two years. Readings were not acquired in 2007 and consequently, the instrumentation should be monitored in 2008.

NORTH VALLEY WALL INTERCEPTOR DITCH (NVWID)

LOCATION: North side of the valley containing the tailings impoundments, along the north side of Rose Creek Valley (see Figure 1).

FUNCTION: The NVWID diverts the water from the Upper Guardhouse Creek around the tailings and polishing ponds. The NVWID was constructed in 1980/81 as part of the Down Valley Tailings Project. The design flood for the ditch was the 50 year return period flood with one half (0.5) meter freeboard above the design flood level (Golder, 1980). Figure 13 provides photographs of the NVWID.

LENGTH: +/- 3,000 m

GRADIENT: 1.25 to 2.5% in the Mine Leg; 1.5% in the Borrow Area "F" Segment; and 4.5 to 5% at the north abutment of the Cross Valley Dam (the "Outfall Section").

INSTRUMENTATION: None.

OBSERVATIONS: The culvert located in the outfall section continues to experience icing problems. The timing of when the icing occurs varies with the stream flow and temperature. Blockage of a culvert in this area has been an on-going issue throughout mine life. a

MAINTENANCE RECOMMENDATIONS: Continue "steaming" of the culvert within the Outfall section to ensure passage of water throughout the winter. Depending on the performance of the culvert during the winter of 2008, additional work may be warranted.

CONCLUSIONS: Selected sections were inspected, including the Outfall Section at the access road, and no concerns were noted. Overall, the NVWID appears to be performing acceptably.

In an attempt to reduce culvert icing, a wooden cover can be placed over the inlet and outlet ends of the culvert. This method has only met with limited success in the past

INTERMEDIATE DAM

LOCATION: Located at the west end of the Intermediate Pond, immediately east of the Polishing Pond (see Figure 2).

FUNCTION: Retain tailings solids, supernatant water and run-off water. Figures 14 to 17 provide photographs of the Intermediate Dam.

LENGTH: 650 m.

MAX HEIGHT: 32 m.

CREST ELEVATION: 1049.2 m; spillway elevation: 1047.7 m.

CREST WIDTH AND CONDITION: Crest width 6–7 m. The crest was repaired in 2003. The repairs consisted of the recommended crack filling and regrading (placement of about 250 mm of granular material on the crest). Cracking is occurring in the edge of the rip rap, which is discussed further in the rip rap section. Only minor cracking was noticed in the early spring due to frost action

Small shrubs and trees were removed from the crest in 2007.

SPILLWAY: At the time of the inspections, the pond level in the Intermediate Reservoir was lower than the spillway inlet. The capacity of the spillway was calculated in 2006 (NHC 2006) based on survey information collected in 2004 and 2005. The calculated capacity of the spillway was 32 m^3/sec (reservoir water level at top of dam core).

There are some areas of the upstream portion of the spillway that have been disturbed as part of the water treatment within the spillway. It is understood that this treatment system will be removed in 2008. Following removal, the area should be examined to see if repairs are needed.

Sludge ponds have been added to the Down Valley Treatment System, within the Polishing Pond, at the discharge point of the Intermediate Spillway. It is understood that the Down Valley Treatment System will likely be removed in 2008.

RIPRAP: The water elevation in the Intermediate Pond continues to be maintained below the elevation originally intended, this is done for water treatment purposes. Deformation and sloughing of the rip rap was noted in 2006 and repairs were recommended. Repairs to the rip rap were undertaken in 2007 (See Appendix III). From a physical stability standpoint, the water level in the pond should be maintained such that the water level is within the zone protected by rip rap. If the pond is maintained lower than the area now protected by rip rap (for

water treatment purposes), additional future maintenance of the rip rap will be required.

INTERMEDIATE DAM CONTINUED

DOWNSTREAM SLOPE: 2:1 slope angle, 2.1:1 overall, including 20 m berm. The downstream slope of the dam was rehabilitated in 2003. The surface of the downstream face of the dam was generally smooth; only minor rilling was noted in the site inspections. The gullies and minor sloughing should be monitored next spring following runoff and thaw.

Small shrubs and trees were noted during 2006. They were removed in 2007 by site staff.

The minor sloughing and erosion of the downstream slope of the dam had covered the drain (BGC 2007f). It was recommended that the drain material be exposed, by removing the slough material. This was completed in 2007.

SEEPAGE: During this year's inspections, no signs of seepage were noted at the south abutment toe.

INSTRUMENTATION: Readings of the ID instruments for 2007 were obtained in beginning and end of March, June and October. Tabulated data and plotted records are presented in Appendix IV and summarised in Table 9. The positions of these instruments are shown in the section in Figures 2 and 18.

PIEZOMETERS*:* The deep piezometer located in 91-ID3 continues to indicate an overall trend of declining pore pressures with time, with 2007 generally continuing this trend, although a small increase was noted in 2007. This small increase could be related to the cold conditions experience in November 2006. It is inferred that the piezometer data reflects abutment conditions dominated by drainage from upslope, not the level of the tailings pond upstream of the dam. That inference is supported by the sudden increase in piezometric level of 2 m recorded by both tips in June 1992, which would be coincident with the spring freshet in the adjacent diversion channel. Therefore, the decline in piezometric pressure recorded by 91-ID3 may be related to better drainage associated with ongoing loss of permafrost in the abutment downstream of the dam.

INTERMEDIATE DAM CONTINUED

Additional general observations about the 2007 Intermediate Dam piezometric monitoring data include the following:

- Similar conditions to historical readings were observed in 96-2
- Normal readings were observed in 96-ID3, 96-ID4, 96-ID6, 96-ID7, 96-1, 96-3, 96-4, 94-IDC-1, P01-03, and P01-04.
- The data from the pneumatic piezometer 91-ID3, 91-ID4, 91-ID6 and P01-04 indicates the presence of a downward hydraulic gradient.
- Hydrostatic conditions exist within the nested standpipe piezometers located at P96-3, and P96-4.
- The piezometric information from P01-04 indicates pore pressures within the foundation of the dam and not the pore pressures within the dam itself.
- Piezometer BKS04-06 and 94-IDC-1 are dry.

MAINTENANCE RECOMMENDATIONS: The following maintenance / monitoring requirements are recommended:

- Monitor the crest cracking of the dam for deteriorating conditions following thaw.
- Monitor the erosion gullies that have formed on the downstream slope.
- Continue to monitor for seepage discharge at the south abutment.

CONCLUSIONS: Overall, the Intermediate Dam appears to be performing in an acceptable manner. The piezometers and monitoring wells along the toe of the dam indicate a piezometric surface ranging between 2.2 and 4.3 m below ground surface (bgs). The piezometers and monitoring wells installed at the crest of the dam indicate a piezometric surface ranging from 19.2 to 21.1 m bgs. The piezometer in the south abutment of the dam indicates drained conditions in the upper 7 m. The deep tip (15.2 m bgs) in the south abutment indicates pore pressures at depth are continuing a declining trend. It is recommended that monitoring of all functional piezometers and monitoring wells in the Intermediate Dam continue in 2008.

CROSS VALLEY DAM

LOCATION: Immediately west of the Polishing Pond, at the downstream (western) limit of the Rose Creek Tailings Area (see Figure 2).

FUNCTION: Designed to have capacity for 60-day retention of seepage/discharge water from the Intermediate Dam. Used as a polishing pond and later for treatment residue retention. Figures 19 through 21 provide photographs of the Cross Valley Dam (CVD).

LENGTH: 500 m.

MAX HEIGHT: 17 m.

CREST ELEVATION: 1033.1 m

CREST WIDTH AND CONDITION: 6–7 m. Some minor crest cracking located near upstream side of rip rap.

The small trees and shrubs that were beginning to grow on the crest of the dam were removed during 2007.

SPILLWAY: Elevation: 1031.7 m. During the site inspections, the upstream pond was lower than the inlet elevation of the spillway. During the inspections, no water was being transferred from the polishing pond. The inlet to both the spillway and pilot channel were in satisfactory condition, based on the visual inspection. The capacity of the spillway was calculated in 2006 (NHC 2006) based on survey information collected in 2004 and 2005. The calculated capacity of the spillway was 300 m^3/s (reservoir water at dam core).

RIPRAP: The water level appears to have been held lower than the lowest elevation of the rip rap for some time over the past few years. Erosion scarps had formed on the face of the dam below the lowest elevation of the rip rap. Locally, small sloughs have occurred in the riprap due to this erosion.

During 2007, site staff performed repairs to the rip rap in local areas.

DOWNSTREAM SLOPE: 2:1 slope angle. The downstream face appears to be in satisfactory condition, with no seepage, cracking or deformation noted.

The trees and shrubs that were growing on the downstream face of the dam and at the toe of the dam were removed in 2007.

SEEPAGE: The 2007 data and the historic summary of weir flows are presented in Tables 10 and 11. Weir flows for 2007 are summarised on Figure

CROSS VALLEY DAM CONTINUED

22. The Weir X13 quantity is slightly more than to the combined flow volumes of X11, X12 and W3, but a difference exists between the calculated combined flow rates and the flow rate, as presented in Table 10. This difference is due to contributing surface run-off or from additional groundwater flow which comes to surface downstream of the seepage trench.

The north portion of the seepage collection trench, as measured by Weir X-11, produces the majority of the seepage water. Additionally, this area has artesian pressures at depth. This performance is consistent with past performance. It is thought that this area experiences high pressures and seepage since it is near the location of the creek prior to the construction of the dam.

The average 2007 flow rate at Weir X13 is 26.5 l/s, which is comparable to the 26 l/s recorded in 2006. This continues the trend, Figure 23, of decreasing average seepage over the years. There are three main potential causes of this reduction; lower pond levels, “fines” accumulation on the base of the Polishing Pond and clogging of the drains in the downstream toe. The upper plot on Figure 23 shows a comparison of the measured flow at X13 to the pond elevations. This shows the decreasing seepage flow trend, despite having similar pond elevations for the period 1988, 1999 and 2000. There has been no measured increase in the pore water pressures at the downstream toe and clogged drains would cause the pore water pressure to increase in this area. Therefore, the most probable explanation of the reduced seepage is that the fines and sludge that are pumped in the Polishing Pond are settling and decreasing the hydraulic conductivity along the seepage path.

INSTRUMENTATION: Readings of the CVD instruments for 2007 were obtained in March, June and October. Tabulated data and plotted records are presented in Appendix IV and summarised in Tables 12 and 13. The positions of these instruments are shown in section in Figure 2 and 24.

PIEZOMETERS*:* Low pore pressures within the foundation and cut-off trench of the dam are indicated by readings taken at instruments CVDC-4, CVDC-7 and CVDP-6. Slightly higher pore pressures are observed at instrument CVDC-9. Higher pore pressures recorded at CVDC-9 are likely related to the fact that the instrument is located in the approximate area of the former Rose Creek channel. Instruments CVDP-1, CVDP-3, CVDP-5, CVDT-1 and P01-11 along the dam toe indicate artesian or near artesian pressures, as observed in previous monitoring.

CROSS VALLEY DAM CONTINUED

Additional general observations with regards to the 2007 Cross Valley Dam piezometric monitoring data include the following:

- Instrument 94CVDC-1 indicates the piezometric surface within the core of the dam is approximately 10 m below the surface of the dam. Similar to past performance.
- Piezometer CVDP-2 malfunctioned and should be abandoned.
- Upward gradient conditions exist in the crest at the location of the nested standpipe piezometer CVDC-7. Similar to past performance.

THERMISTORS*:* The 2007 readings indicate the ground temperatures at depth appear to be stable in Thermistors CVDC-6 and BH-88-4T. The thermistor beads at 21 and 29 m depth in CVDC-6 appear to be malfunctioning and therefore have been ignored.

Data collected in the spring from piezometer BH-88-4 indicates that winter frost penetration extended to a depth of approximately 4 m at this location.

MAINTENANCE RECOMMENDATIONS: The following maintenance/monitoring requirements are recommended:

- Monitor the cracking in the crest of the dam following spring thaw.
- The water level in the pond should be maintained such that the water is within the zone protected by rip rap, or continued monitoring for small scarps forming in the rip rap maintained.
- In some sections of this spillway, the rip rap protection on the banks of the North Valley Wall Interceptor Ditch has been disturbed by equipment traffic some time in the past. The rip rap in the disturbed sections should be re-instated.
- Weirs were repaired in 2005. A calibration check should be undertaken in 2008.

CROSS VALLEY DAM CONTINUED

CONCLUSIONS:

The piezometric pressures recorded from the instrumentation in the Cross Valley Dam indicate that pore pressures remain consistent with previous years' readings. Instrument 94CVDC-1 indicates the piezometric surface within the core of the dam is approximately 10 m below the surface of the dam (approximately 1022.7 to 1023.9 m).

Geothermal instrumentation within the Cross Valley Dam indicates that no permafrost is encountered within the foundation of the dam and winter frost penetration is observed to be approximately 3.5 to 4 m below the crest.

Overall, the dam is exhibiting acceptable performance which is consistent with the historical monitoring at this dam. Continued monitoring of the seepage weirs and functioning instruments in the Cross Valley Dam is recommended for 2008.

NORTH FORK ROCK DRAIN (NFRD)

LOCATION: West of the waste rock piles, part of the haul road that extends to the Vangorda pit (see Figure 1).

FUNCTION: The NFRD was designed to transmit the water flow of the North Fork Rose Creek through the haul road. Figures 25 and 26 provide photographs of the rock drain.

MAX HEIGHT: +/- 55 m

CREST ELEVATION: 1143.9 m

CREST WIDTH AND CONDITION: +/- 25 m, no signs of cracking or settlement evident.

UPSTREAM FACE: Minor channelized erosion and related sloughing has occurred on the upstream side of the rock drain. Some woody debris and silty materials have collected at the base of the upstream face.

DOWNSTREAM FACE: Channelized erosion and related sloughing has occurred on the downstream side of the rock drain due to runoff from the crest haul road. The majority of the woody debris below the water line was removed in 2006.

SEEPAGE: Head pond level was normal during the inspections and the drain appears to be passing the flows in a satisfactory manner.

INSTRUMENTATION:

POND WATER LEVEL: A sensor and datalogger are located in the pond to measure pond water elevations. A benchmark was established on the upstream side of the pond to allow regular pond elevation surveys as a check on the sensor readings. The pond sensor malfunctioned in 2007, possibly as a result of a fire. The measured pond water levels from 2007 (based on surveying of the pond level) and the toe discharge quantities are shown on Figure 27 and in Appendix IV.

By combining the pond water elevation on the upstream face, the elevation of water discharge on the downstream face, and the dimension of the drain, the hydraulic gradient through the drain can be estimated. Comparison of the hydraulic gradient in 2007 to the past few years (the period when data has been collected) indicates that the performance was similar see Figure 28 and in Appendix IV. This indicates that the capacity of the drain has not reduced in this time period. Further evaluation of the hydraulic gradient based on future monitoring is recommended to evaluate the possibility of the drain clogging.

NORTH FORK ROCK DRAIN (NFRD) CONTINUED

FLOW*:* Two staff gauges and a sensor with datalogger are located near the main access road, at Station X2, to measure the discharge in the creek. The flow measurements from 2007 are presented on Figure 28.

MAINTENANCE RECOMMENDATIONS: None required.

CONCLUSIONS: The flow-through rock drain was observed during the site inspections. The discharge area was observed to be flowing clear water from the downstream side. No evidence of significant instability on the slope above the discharge area, other than some old cracks along the top edge of the crest and a minor slough on the upstream face, was observed. On this basis, it appeared that the downstream portion of the causeway section was functioning as intended, and that its performance is not deteriorating.

Detailed recording of the pond water level and creek water elevation by data loggers can be discontinued in 2008. However, monitoring via visual inspection and via the surveying at the pond level, downstream toe should be continued on a twice per month basis (weekly during freshet period). Similarly, the monitoring of the creek flows at X2 and NFRD23 staff gauges should continue on a daily basis.

Confirmation of the rating curve used to convert staff gauge readings to flow should be undertaken in 2008.

FARO CREEK DIVERSION CHANNEL

LOCATION: Top of the east wall of the Faro Pit (see Figure 1).

FUNCTION: The channel transmits creek water, which previously flowed directly through the pit area, over to the North Fork Rose Creek upstream of the rock drain. Figures 29 and 30 provide photographs of the diversion channel.

LENGTH: +/- 1,500 m with an elevation loss of approximately 21 m.

INSTRUMENTATION: Four staff gauges were installed in 2007 to monitor the flow in the diversion. Initially, two staff gauges were installed; one near the inlet to the diversion and the second upstream of the transition to the steep gradient section. These staff gauges were installed by Laberge and their installation report (including rating curve development) is included in Appendix V. Laberge installed two data loggers adjacent to the staff gauges and monitored them throughout the year. Following recommendations made (BGC 2007d), two additional staff gauges were installed within the Faro Creek Diversion. Information on the installation of these gauges is also included in Appendix V.

Data from the monitoring at the staff gauges is included in Appendix IV and is plotted in Figure 31. This figure shows that a flow loss of between 20 and 30% occurs between the upstream and downstream station.

OBSERVATIONS: A seepage event occurred in the north-south arm of the diversion canal; see Section 2.7 for a summary of those events.

Five significant seepage locations were noted during the September inspection. One was related to “seepage event” location, another at the location of a downhill slump and at three other locations. Visual monitoring of these seepage locations should be continued.

A number of small slumps occurred in the uphill slope during the spring thaw period. The ground was too soft and wet for the repairs to be completed in 2007; these should be completed in 2008.

A large slump occurred on the downstream side of the road, near the upstream limit of the Faro Valley Waste Rock Dumps, as shown in Figure 32.

Retrogression of the soil slope between the access road and the edge of the Faro Pit appears to be less than in past years. A detailed review of the stability of the pit wall was performed in 2006 (Golder 2007).

FARO CREEK DIVERSION CHANNEL CONTINUED

RIPRAP: Some slight movement of pilot channel rip rap has occurred.

MAINTENANCE RECOMMENDATIONS: A number of recommendations have been made in relation to the Faro Creek Diversion Canal; these are contained in the two memoranda in Appendix I. Those memos deal with the long-term view of the canal as it relates to operations over the next few years and moving to mine closure. Those recommendations should be reviewed in conjunction with the recommendation made within, which are more related to on-going maintenance issues.

During the spring of 2007 a number of small slumps occurred in the uphill slope of the diversion, these should be repaired by regrading the ground surface.

The slump located on the downhill side of the road, near the Faro Valley Waste Rock Dump, should be repaired. The repair should consist of the installation of drainage and reforming the shoulder of the road.

The locations of the seepage event and other noted seepage areas should be investigated through a series of test pits in 2008.

Monitoring recommendations contained in Golder 2007 for the Faro Pit wall located downstream of the diversion needs to be continued in 2008.

CONCLUSIONS: The canal experienced a significant departure from its typical good behaviour in 2007. It is thought that the extreme cold of November 2006 along with the poor dike foundation condition, were responsible for the deterioration in the performance.

A number of recommendations have been made in order to increase the understanding of the nature of the foundation soil, repair damages that occurred in 2007, understand the seepage losses in the canal and potentially for replacement of this structure. The north-south arm of the diversion canal was the location of all of these events. The east-west leg of the diversion appears to have performed well and no maintenance is required on that portion of the diversion.

SELECTED WASTE ROCK DUMPS

LOCATION: Southeast of the Faro Main Pit (see Figure 1), overlooking North Fork of Rose Creek. Photographs taken during the 2007 inspection are shown in Figure 33.

MAX HEIGHT: Variable

INSTRUMENTATION: None.

MAINTENANCE RECOMMENDATIONS: No maintenance is required.

CONCLUSIONS: Selected northeast waste rock dumps overlooking the North Fork of Rose Creek were inspected during the September site visit. Selected portions of the toe area and crest edges were inspected. No signs of new crest cracking, toe bulging or significant slope instability were noted. Some erosion of the exposed soil was noted near the Faro Creek Diversion Canal.

The review of these dumps is on a two year cycle. Visual inspection of the waste dumps should be performed again in 2009.

SECONDARY TAILINGS IMPOUNDMENT (EAST OF DIVERSION DAM)

LOCATION: Located on the east side of the Down Valley project area. The east leg of the Secondary Tailings Dam is directly adjacent to either the North Fork of Rose Creek or the original portion of the RCDC. See Figure 3.

FUNCTION: Retain tailings solids, supernatant water and run-off water from flowing into the Rose Creek Diversion Canal. Figures 34 to 35 provide photographs of the Secondary Dam and Tailings Impoundment.

LENGTH: Approximately 1120 m.

MAX HEIGHT: Approximately 28 m.

CREST ELEVATION: Varies from 1060.2 m to 1063.3 m.

CREST WIDTH AND CONDITION: Approximately 6 m, capped with a protective layer of sand and gravel fill. No concerns were noted with the crest of the road.

LOWER ROAD No concerns were noted.

SPILLWAY: N/A

BACKSLOPE: 2:1 slope angle.

SEEPAGE: During this year's inspections, no signs of seepage were noted at the toe of the Secondary Dam.

INSTRUMENTATION: Readings of the Secondary Tailings Impoundment instruments for 2007 were obtained in June and September. Tabulated data and plotted records are presented in Appendix IV and summarised in Table 14. The piezometric data for the P03 series of instruments was supplied by Gartner Lee and is in Appendix IV.

PIEZOMETERS*:* Readings were collected from the piezometers in the Secondary Dam and Secondary Impoundment Areas.

The three piezometers within the Secondary Dam: P81-06, P81-07 and P81-08, recorded dry conditions in 2007.

The three piezometers within the tailings impoundment and near to the eastern portion of the secondary dam, P03-01, P03-02, and P03-03, indicated conditions at or near hydrostatic at an elevation of approximately 1054 m to 1055 m amsl, are shown on Figure 36.

SECONDARY TAILINGS IMPOUNDMENT (EAST OF DIVERSION DAM) CONTINUED

MAINTENANCE RECOMMENDATIONS: None required

CONCLUSIONS: Based on the piezometric information available, the elevation of the water table in the secondary tailings impoundment ranges from approximately 1054.4 m to 1055.3 m, depending on seasonal variability. The elevation of Rose Creek in the Diversion Canal along the east arm of the Secondary Dam is approximately 1054.1 m. Under these conditions, and assuming a uniform head loss between the tailings and the water levels in the Diversion Canal, the piezometric levels in the Secondary Dam should be at an elevation of approximately 1054.3 m, but were dry since the piezometers terminate above this elevation. The geometry and piezometric assumptions mentioned above are conceptually illustrated on Figure 36.

The low piezometric levels in the secondary tailings impoundment is a result of the long term “drain down” in the tailings area and appears to be reflective of the overall tailings deposit piezometric conditions.

Overall, the Secondary Tailings Impoundments is performing in an acceptable manner. The piezometers and monitoring wells installed at the crest of the dam indicate dry, well drained conditions. It is recommended that monitoring of all functional piezometers and monitoring wells in the Secondary Tailings Impoundment continue in 2008.

5.0 INSTRUMENTATION, MONITORING AND ANNUAL REVIEW

5.1 Instrumentation Readings

The frequency of readings of the instrumentation has been greatly reduced from the initial practice of quarterly observations because confidence in the performance of the structures has been substantiated by accumulated data. Figure 37 provides a schedule of readings for 2008 for the major structures, broken down by month. As has been the case over the last several years, all instrumentation data collected by site staff should be immediately forwarded to BGC for review.

If any rapid lowering of either reservoir in the Down Valley is expected, then BGC should be consulted and changes to the monitoring program may be made.

It is recommended that the pond levels on the upstream side of the flow-through causeway be measured and correlated to measured flow in the North Fork of Rose Creek. In the past few years, this has included monitoring by data loggers and manual readings. In 2008, the data loggers can be removed (to be used elsewhere on site, as needed). Monitoring of the rock drain should be continued at the pond, downstream toe and at Station X2 using the existing staff gauges.

It is recommended that new staff gauges be installed within the Rose Creek Diversion Canal. The purpose of the new staff gauges would be to monitor the amount of seepage loss it the different reaches of the canal, but particularly near the Intermediate Dam. The new staff gauges should be installed and rating curves developed for each of the new instruments. Given this program of staff gauge installation, a supplemental staff gauge should be installed in the flat section between the upper and lower weir sections.

It is recommended that two new piezometers be installed in the spoil pile above the seepage that is occurring into the Cross Valley dam pond.

It is also recommended that the visual inspection program be expanded to include the K8 Creek Rock Drain.

BGC05-04 and 07 were installed in 2005 but have not been read due to an incompatibility of the switchbox. This should be repaired in 2008.

Need to perform a check of the rating curve for NFRC 23. This involves collecting direct stream flow measurements and staff gauge readings. Between four and eight readings should be taken throughout the year to confirm the rating curve.

The rating curves for the four weirs at the Cross Valley Dam should be checked in 2008.

5.2 Routine Inspections by On-Site Personnel

Any change in condition that is noted as a consequence of this program of routine inspection must be brought immediately to the attention of the inspector's superiors. BGC must also be notified so that the condition can be evaluated in light of the prior performance history of the structures, and to provide any necessary geotechnical advice related to the concern at hand. Photos of the changed condition should be taken and forwarded to BGC.

5.2.1 Rose Creek Diversion Canal

It is important that current site staff continue with their inspection program as described below, and that a log of observations be maintained:

1. To inspect the Rose Creek Diversion Channel before run-off to ensure any snow and/or ice blockages are removed.
2. To inspect, on a monthly basis, the 400 m reach of the Diversion Canal dike crest immediately upstream of the Intermediate Dam for evidence of cracking.
3. To view on a monthly basis, the opposite side of the Diversion Canal from the canal dike looking for change to the top profile of the gravely backslope, possible narrowing of the flow channel, and other changes which might be attributed to sloughing of the backslope.
4. To inspect in June, just after spring runoff is completed, the top of the thermal liner on the backslope of the Diversion Canal at the location situated about 500 m upstream of the Intermediate Dam; such inspection to determine if new (sharp-edged) cracking has developed.
5. Visually monitor the sloughing of the Spoil Pile at the Polishing Pond shoreline.
6. Monitor the NFRD-4 (Rose Creek Staff Gauge) on a daily basis. Monitor the proposed staff gauges in the Rose Creek Diversion Canal according to the schedule shown in Figure 37.

5.2.2 Intermediate Dam

Weekly inspections should continue at the abutments of the Intermediate Dam for evidence of: changing conditions (sloughing of the embankment fill and/or the adjacent slopes); active crest cracking; sloughing of the riprap; and for evidence of changing seepage rates (especially the south abutment toe seepage) and locations.

The Intermediate Dam Pond levels should be noted and recorded on a weekly basis. Consideration should be given to automating this task through the installation of pore pressure transducers and dataloggers so that continuous data may be collected. Any pressure transducer must be able to withstand the water environment within the pond.

5.2.3 Cross Valley Dam

Weekly inspections should continue at the Cross Valley Dam's abutments and downstream toe berm culverts. The abutments should be inspected for evidence of: changing conditions (sloughing of the embankment fill and/or the adjacent slopes); sloughing of the riprap; active crest cracking; and for evidence of changing seepage rates and locations. The downstream toe berm culverts should be inspected for consistency of flow rate.

The Polishing Pond levels should be noted and recorded on a weekly basis. Consideration should be given to automating this task through the installation of pore pressure transducers and dataloggers so that continuous data may be collected.

5.2.4 North Fork Rose Creek Flow-Through Causeway

Additional data should be collected in 2008 as detailed in Section 5.1. This additional data should include pond levels, water levels at the downstream toe of the drain, and flow downstream of the drain. Data during periods of high flow is particularly important and, as a minimum, the head pond should be viewed and surveyed weekly in the late afternoon for the period from about April 15th until June 30th.

The upstream and downstream faces of the rock drain should also be inspected monthly for any signs of instability or sloughing.

Monitoring of the staff gauge at X2, and NFRC23 should be continued on a daily basis.

5.2.5 Faro Creek Diversion Canal

Continue with both visual and survey monitoring of the overburden ravelling proximal to the access road and diversion channel. Assess if the average ravelling rate noted by Golder (2007) is appropriate or if conditions have changed following rehabilitation of the channel. The monitoring program recommended by Golder should be continued.

Visual inspection of the access road and channel sections for cracks and for overburden ravelling overlooking the Faro Pit should be undertaken monthly from May until October. Any signs of deformation should be forwarded to BGC for comment.

A test pit program should be performed on the north-south arm of the diversion. The purpose of this program is to identify soft and wet foundation areas within this portion of the diversion. This task will help to quantify the risks presented by the diversion and to identify specific areas that should be the focus for the site staff during their visual monitoring.

A program of testpitting should be performed in the north south arm of the diversion canal.

5.2.6 Faro Waste Rock Dumps

Continue visual monitoring of dump slopes by site staff.

5.2.7 Secondary Tailings Impoundments – East Leg

Continue visual monitoring of the crest and the toe of this dam on a weekly basis by site staff. Monitoring of the instrumentation within this structure should continue.

5.3 Annual Reviews

As has been noted in previous annual reports, the performance monitoring and annual inspections of facilities has served as a basis for:

a. judging current performance of the facilities;
b. providing some forewarning of any trends towards potentially troublesome performance;
c. adjusting the frequency of observation of instrumentation;
d. recommending the installation of additional instrumentation; and
e. undertaking maintenance work.

In keeping with the important nature of these facilities, and the inherent value of keeping a comprehensive performance record, it remains prudent to continue with the data acquisition. As such, Figure 37 provides a proposed schedule of instrumentation monitoring for 2008. The collection of current data is of both immediate and ongoing value, to review such data in relation to the existing database and to visually inspect the works on an annual basis for evidence of deteriorating or deficient performance.

Annual inspections in 2008 should be performed in May/June (near the freshet period) and early September, in keeping with the schedules held for previous inspections, and for the advantage of consistency of conditions.

6.0 CLOSURE

This report summarizes the physical conditions as observed by BGC and the instrumentation results as collected by site staff on various mine waste facilities and structures at Faro Mine. Thank you for the opportunity to be of service to Deloitte & Touche and Faro Mine. Should you have any questions on this report, please contact BGC at your convenience.

Respectfully submitted,
BGC ENGINEERING INC.
Per:

Behnam Fonouni, M.Sc., M.Eng.
Geotechnical Specialist

Gerry Ferris, M.Sc., P.Eng.
Geotechnical Engineer

James W. Cassie, M.Sc., P.Eng.
Specialist Geotechnical Engineer

REFERENCES

BGC Engineering Inc. 2003. Emergency Preparedness Plan for Selected Dams and Water Diversion Structures. Submitted to Deloitte and Touche Inc., October 20, 2003.

BGC Engineering Inc. 2007a. Operations Maintenance & Surveillance Manual for Selected Dams. Interim Final 2. Manual submitted to Deloitte and Touche Inc., February 2007.

BGC Engineering Inc. 2007b, Summary of Seepage Event and Remediation Efforts, Faro Creek Diversion Channel. Memo style report submitted to Deloitte and Touche Inc, May 23, 2007.

BGC Engineering Inc. 2007c, Supplementary Memo on Channel Rehabilitation Needs, Faro Creek Diversion Channel, Memo style report submitted to Deloitte and Touche Inc., June 28, 2008.

BGC Engineering Inc. 2007d, Summary of Notes and Recommendations, FMEA Risk Assessment, Faro Creek Diversion Channel, Memo style report submitted to Deloitte and Touche Inc., July 27, 2007.

BGC Engineering Inc. 2007e, Remediation Construction Summary, Faro Creek Diversion, Memo style report submitted to Deloitte and Touche Inc., September 17, 2007.

BGC Engineering Inc. 2007f. 2006 Annual Geotechnical Evaluation & Instrumentation Review. Various Facilities at Faro Mine, Yukon. Report submitted to Deloitte and Touche Inc., Project No 0257-039-05, February, 2007.

Golder Geotechnical Consultants Ltd. 1980. Final Design Recommendations for the Down Valley Tailings Disposal Project, Faro, Yukon Territory. Report No. 792-2025 submitted to Cyprus Anvil Mining, three volumes, June, 1980.

Golder Associates 1982. Down Valley Tailings Containment Project, 1980-81 Construction, Faro, Yukon. Report 802-2038 submitted to Cyprus Anvil Mining Corporation, February 1982, three volumes.

Golder Associates Ltd. 2007. Faro Pit slope movement monitoring. Letter report submitted to Deloitte and Touche Inc.

Klohn Crippen Consultants Ltd. 2002. Anvil Range Property- 2002 Dam Safety Review. A report prepared for Deloitte & Touche Inc.

Klohn Crippen Berger Ltd. 2008. Anvil Range Mining Complex, 2007 Dam Safety Review for Cross Valley, Intermediate and Little Creek Dams. A report under preparation.

Northwest Hydraulic Consultants Inc. 2006 Faro Mine Hydraulic Capacity Analysis. Final Report submitted to Deloitte and Touche Inc. June 2006.

Sigma Resource Consultants LTD, 1975. Rose Creek Diverisons Works, Observations and Measurements Made During Spring Runoff -1975. Cyprus Anvil Mining Corporation.

TABLES

Table 1 Summary of Polishing Pond and Intermediate Pond Levels

DATE	Cross Valley Pond Elevation (m amsl)	Intermediate Dam Pond Elevation (m amsl)
January 4, 2007	1028.950	1046.620
January 18, 2007	1029.090	1046.640
February 1, 2007	1029.200	1046.678
February 15, 2007	1029.308	1046.717
March 8, 2007	1029.480	1046.660
March 29, 2007	1029.632	1046.610
April 2, 2007	1029.650	
April 12, 2007	1028.750	1046.723
April 18, 2007		1046.715
April 23, 2007		1046.790
April 26, 2007	1029.100	1046.830
April 30, 2007		1046.800
May 3, 2007	1029.358	1046.800
May 7, 2007	1029.498	1046.812
May 9, 2007	1029.295	
May 10, 2007	1029.191	1046.809
May 14, 2007	1028.770	1046.772
May 17, 2007	1028.980	1046.795
May 22, 2007	1028.933	1046.781
May 24, 2007	1028.837	1046.705
May 28, 2007	1028.846	1046.638
May 31, 2007	1028.840	1046.570
June 4, 2007	1028.661	1046.490
June 7, 2007		1046.437
June 11, 2007	1028.626	1046.341
June 14, 2007	1028.605	1046.287
June 18, 2007	1028.561	1046.211
June 21, 2007	1028.560	1046.113
June 25, 2007	1028.880	1046.120
June 28, 2007	1028.850	1046.120
July 3, 2007	1028.787	1046.112
July 5, 2007	1028.789	1046.088
July 9, 2007	1028.846	1046.030
July 12, 2007	1028.800	1046.037
July 19, 2007	1028.763	1046.085
July 26, 2007	1028.692	1046.082
August 2, 2007	1028.608	1046.142

Continued on Next Page

Table 1 Summary of Polishing Pond and Intermediate Pond Levels (Continued)

DATE	Cross Valley Pond Elevation (m amsl)	Intermediate Dam Pond Elevation (m amsl)
August 9, 2007	1028.547	1046.110
August 16, 2007	1028.374	1046.140
August 23, 2007	1028.085	1046.152
August 27, 2007		1046.150
August 30, 2007	1028.038	1046.191
September 6, 2007	1028.025	1046.268
September 11, 2007	1028.025	
September 12, 2007	1027.910	
September 13, 2007	1027.845	1046.375
September 17, 2007	1027.559	
September 24, 2007	1027.755	
September 27, 2007	1027.840	1046.543
October 15, 2007	1028.295	1046.689
October 18, 2007	1028.358	1046.710
October 22, 2007	1028.442	
October 25, 2007	1028.220	1046.736
October 29, 2007	1027.997	
November 8, 2007	1028.268	1046.831
November 22, 2007	1028.551	1046.890
December 6, 2007	1028.802	1046.920

Table 2 Total Monthly Precipitation (mm) At Faro Airport, Yukon

Year	Jan	Feb.	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total (mm)
1978	0.4	**miss.**	trace	4.1	11.6	27.0	38.1	41.6	7.8	32.4	20.2	19.0	
1979	8.9	18.3	20.2	6.7	10.5	68.2	55.4	13.8	13.4	11.6	12.4	34.4	273.8
1980	19.7	2.4	11.7	12.5	10.5	11.1	95.4	33.2	46.7	**miss.**	21.3	13.3	
1981	6.5	23.1	4.0	4.5	7.8	42.8	41.3	22.5	41.9	21.5	17.0	5.4	238.3
1982	10.2	18.0	9.5	4.1	18.2	14.3	58.3	47.3	47.2	42.3	11.8	13.6	294.8
1983	35.7	6.6	9.8	2.2	20.6	55.6	49.1	65.8	21.2	16.3	11.4	3.9	298.2
1984	27.6	24.1	5.9	2.4	38.8	49.0	16.6	64.9	5.5	10.8	10.7	22.5	278.8
1985	22.5	24.8	2.2	13.8	17.2	28.1	62.6	80.8	46.3	20.0	22.2	26.1	366.6
1986	8.4	4.7	34.6	12.9	35.1	12.8	81.8	77.4	44.4	22.7	15.9	5.6	356.3
1987	3.1	14.0	2.8	10	40.1	50.8	92.4	63.5	30.2	26.6	17.8	6.2	357.5
1988	7.0	10.4	17.2	8.2	38.0	37.3	97.2	25.5	43.8	29.0	17.9	16.5	348.0
1989	19.8	3.6	19.8	2.0	17.9	41.0	51.7	16.9	30.8	46.3	39.8	13.8	303.4
1990	14.4	25.8	5.0	7.0	23.4	45.4	30.0	64.4	66.2	22.7	25.4	24.8	354.5
1991	17.2	22.6	16.6	2.8	22.4	30.2	115.4	33.0	48.2	49.6	43.4	40.0	441.4
1992	22.8	24.6	7.6	15.8	14.4	11.4	66.1	34.4	47.8	13.8	18.8	13.0	290.5
1993	22.2	15.0	1.6	6.0	76.7	48.6	50.2	56.0	50.8	35.7	**miss.**	**miss.**	
1994	20.2	8.4	11.4	5.0	39.8	24.2	19.6	25.2	45.6	41.6	24.4	8.0	273.4
1995	8.4	7.8	18.4	5.2	10.9	33.9	73.4	63.4	28.8	12.2	22.3	15.4	300.1
1996	10.2	9.1	27.1	7.2	13.4	20.0	64.4	70.8	52.7	34.8	3.5	5.9	319.1
1997	6.6	8.7	1.4	14	16.5	39.3	86.4	33.2	trace	25.2	6.4	12.4	250.1
1998	7.0	2.8	4.8	4.2	14.4	29.6	19.2	24.2	23.4	24.0	4.6	8.2	166.4
1999	24.4	10.0	15.4	1.8	44.4	64.8	42.0	33.8	27.0	22.4	12.8	21.6	320.4
2000	12.2	2.0	trace	6.0	9.6	39.6	48.1	116.2	102.2	8.6	19.4	5.8	369.7
2001	7.4	3.0	4.0	14.6	30.8	35	58.4	14.2	44.6	28.6	12.2	15.4	268.2
2002	9.2	5.8	9.0	7.0	19.6	19.4	34.9	64.1	38.4	18.2	9.6	9.4	244.6
2003	22.4	8.0	16.0	0.4	7.6	45.2	63.2	30.4	30.8	12.8	32.8	19.9	289.5
2004	31.1	11.4	45.0	4.0	15.6	34.0	13.5	38.0	48.5	33.6	9.8	45.0	329.5
2005	26.7	12.4	2.6	19.5	58.6	41.0	83.8	38.6	36.6	13.0	30.0	10.8	373.6
2006	11.0	7.0	18.5	21.6	16.2	38.0	33.4	33.3	35.6	21.0	33.1	8.3	277.0
2007	**miss.**	**miss.**	**miss.**	**miss.**	**miss.**	47.2	35.4	22.2	46.4	**miss.**	**miss.**	**miss.**	
Max	35.7	25.8	45	21.6	76.7	68.2	115.4	116.2	102.2	49.6	43.4	45	
Year	1983	1990	2004	2005	1993	1979	1991	2000	2000	1991	1991	2004	
Mean	**15.3**	**11.9**	**12.7**	**7.8**	**24.2**	**36.2**	**55.9**	**45.0**	**39.8**	**24.9**	**18.8**	**15.9**	**307.1**
Min	0.4	2	1.4	0.4	7.6	11.1	13.5	13.8	5.5	8.6	3.5	3.9	
Year	1978	2000	1978	2003	2003	1980	2004	1979	1997	2000	1996	1983	
St.Dev	9.0	7.8	10.6	5.6	16.4	14.8	26.3	23.9	18.4	11.3	10.1	10.5	

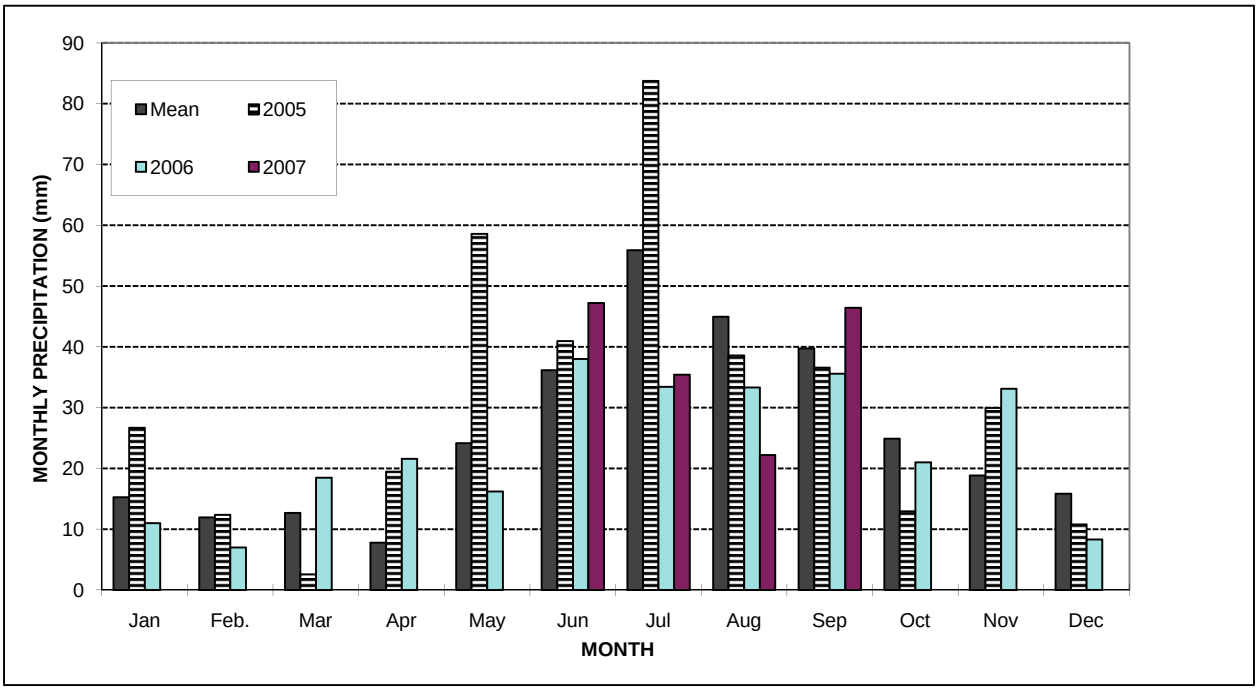


Table 3 Monthly Average Temperature (°C) At Faro Airport, Yukon

Year	Jan	Feb.	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1977	**miss.**	**miss.**	**miss.**	**miss.**	**miss.**	**miss.**	**miss.**	**miss.**	**miss.**	**miss.**	**miss.**	-30.5	
1978	-21.9	-13.9	-7.3	0.3	7.4	12.8	15.3	13.2	8.6	1.6	-15.7	-19.9	**-1.6**
1979	-26.7	-30.6	-5.1	-0.7	6.5	11.7	15.1	14.1	8.7	1.3	-8.2	-21.6	**-3.0**
1980	-26.6	-11.1	-8.6	2.6	8.6	14.5	14.4	11.3	5.1	2.6	-7.6	-34.6	**-2.5**
1981	-8.9	-15.8	-4.0	-3.3	10.0	11.0	14.8	12.8	5.5	-1.2	-8.8	-24.7	**-1.1**
1982	-37.3	-21.2	-13.4	-2.0	5.6	13.9	15.9	11.7	7.6	-3.8	-17.6	-19.0	**-5.0**
1983	-22.7	-15.8	-10.0	1.4	7.7	13.3	14.6	11.0	3.7	-1.9	-14.7	-32.0	**-3.8**
1984	-18.6	-9.7	-3.1	2.4	6.8	11.7	13.7	11.5	5.9	-3.6	-16.6	-24.0	**-2.0**
1985	-9.0	-21.2	-8.5	-1.9	6.2	10.6	14.4	10.4	5.9	-3.9	-24.2	-12.5	**-2.8**
1986	-12.1	-15.6	-8.2	-4.9	5.7	12.3	15.5	10.8	6.4	0.6	-18.6	-12.9	**-1.8**
1987	-14.4	-11.5	-12.4	0.5	7.2	12.1	15.2	12.2	6.4	1.9	-8.4	-14.5	**-0.5**
1988	-21.5	-12.0	-4.4	1.8	8.3	13.3	14.0	12.2	6.0	-1.8	-11.7	-16.1	**-1.0**
1989	-26.4	-19.3	-14.6	1.5	8.9	13.7	16.4	15.0	7.2	-2.6	**miss.**	-13.1	
1990	-20.8	-24.0	-6.0	1.6	8.8	12.8	15.6	13.5	8.2	-3.1	-23.8	-23.1	**-3.4**
1991	-20.0	-11.2	-9.2	1.8	8.5	13.3	14.2	11.0	7.7	-4.6	-13.2	-16.5	**-1.5**
1992	-13.3	-13.8	-5.6	-0.7	5.0	13.0	15.3	12.1	1.4	-4.2	-9.0	**miss.**	
1993	-21.3	-16.1	-7.2	2.6	8.8	13.3	14.4	12.0	6.9	0.4	-11.6	-14.2	**-1.0**
1994	-23.9	-25.6	-4.4	2.9	7.2	13.1	16.2	16.1	5.5	0.1	-17.3	-20.0	**-2.5**
1995	-20.1	-14.8	-11.1	3.5	10.0	14.4	14.6	11.3	9.9	-0.9	-17.2	-21.2	**-1.8**
1996	-34.8	-15.0	-11.8	-1.2	5.7	12.2	14.7	10.5	5.7	-6.4	-18.9	-23.9	**-5.3**
1997	-25.6	-10.7	-12.7	1.2	7.5	13.5	16.0	13.0	8.3	-5.9	-10.4	-11.7	**-1.5**
1998	-25.2	-10.8	-8.1	2.6	9.5	14.1	15.7	11.9	6.3	-1.3	-14.3	-19.8	**-1.6**
1999	-23.3	-17.7	-7.7	1.1	5.7	14.2	14.0	14.1	7.4	0.1	-13.1	-12.6	**-1.5**
2000	-18.7	-10.2	-4.8	-1.1	5.7	13.6	14.1	10.6	5.1	-1.4	-10.3	**miss.**	
2001	-10.8	-16.4	-8.6	0.9	5.6	13.3	14.7	14.0	7.5	-2.0	-13.9	-21.2	**-1.4**
2002	-17.8	-14.8	-14.4	**miss.**	**miss.**	**miss.**	**miss.**	**miss.**	**miss.**	**miss.**	**miss.**	-14.9	
2003	**miss.**	**miss.**	**miss.**	**miss.**	**miss.**	**miss.**	**miss.**	**miss.**	**miss.**	**miss.**	**miss.**	**miss.**	
2004	-9.2	-8.7	1.6	8.4	17.1	15.9	13.7	4.5	-1.9	**miss.**	**miss.**	**miss.**	
2005	-22.4	-15.8	-3.3	2.0	11.1	14.8	14.5	13.7	7.4	-0.1	-9.3	-13.6	**-0.1**
2006	-20.1	-14.1	-11.8	0.5	7.7	15.0	16.4	12.5	7.8	-1.4	-26.4	-14.7	**-2.4**
2007	-16.2	-22.0	-14.6	0.3	7.6	14.0	15.8	14.4	6.0	-2.2	-11.4	-21.6	**-2.5**
Max	-8.9	-8.7	1.6	8.4	17.1	15.9	16.4	16.1	9.9	2.6	-7.6	-11.7	
Year	1981	2004	2004	2004	2004	2004	2006	1994	1995	1980	1980	1997	
Mean	**-20.5**	**-15.6**	**-8.0**	**0.9**	**7.9**	**13.2**	**14.9**	**12.1**	**6.3**	**-1.6**	**-14.4**	**-19.3**	**-2.1**
Min	-37.3	-30.6	-14.6	-4.9	5.0	10.6	13.7	4.5	-1.9	-6.4	-26.4	-34.6	
Year	1982	1979	1989	1986	1992	1985	2004	2004	2004	1996	2006	1996	
St.Dev	7.0	5.1	3.9	2.5	2.4	1.2	0.8	2.1	2.4	2.4	5.2	6.3	

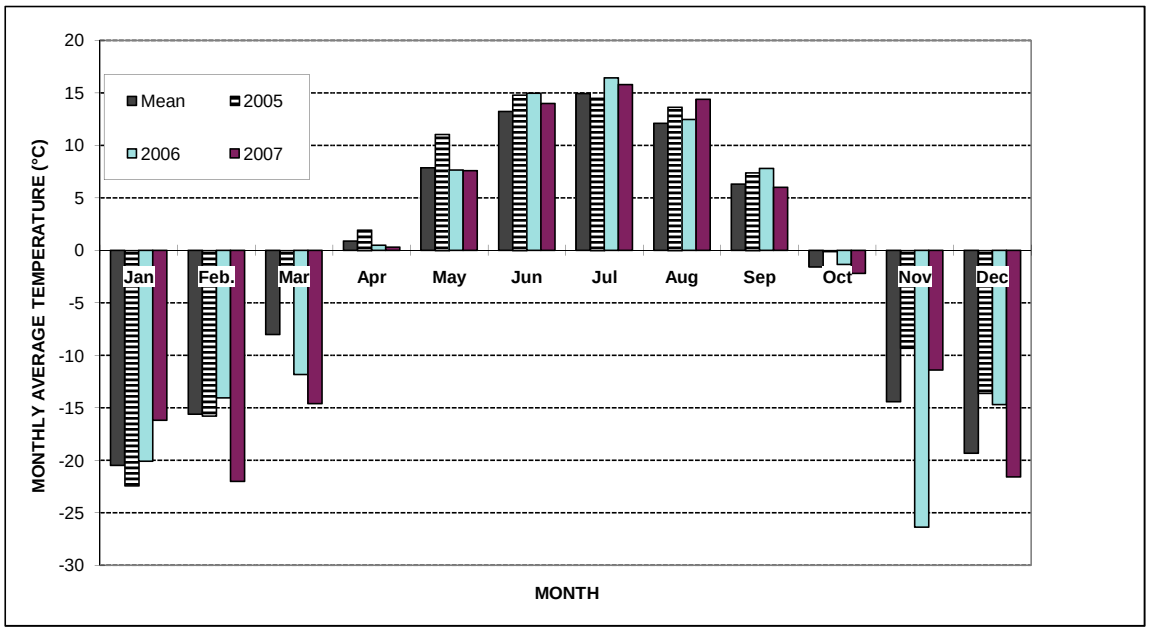


Table 4 Diversion Canal - Canal Dike - Piezometers

Installation	Date Installed	Standpipe (S) or Pneumatic (P)	# of Readings in 2007	Ground Elevation (m amsl)	Tip Elev. (m amsl)	Historic Low Reading/ Date	Historic High Reading/ Date	2007 Low Reading/ Date (Compared to 2006 Low)	2007 High Reading/ Date (Compared to 2006 High)	Comments
CD-10	1981	P	2	1056.4	1045.3	1045.97/ Mar 1982	1050.48/ Sep 1992	1049.08/ Jun 6 (+0.07)	1049.36/ Sep 24 (-0.14)	Readings consistent with previous data.
CD-13	1981	P	2	1055.2	1048.7/ **1044.7**	1049.05/ Sep 1995 **1047.57/ May 1982**	1051.64/ Jun 2000, Jun 2001 **1051.35/ Jun 2007**	**1050.51/ Sep 24 (+0.42)**	**1051.35/ Jun 6 (+0.56)**	Shallow piezometer no longer functioning properly. Historically the gradient was downward.
CD-15	1981	P	2	1054.9	1048.10/ **1043.30**	dry/Sep 2007 **1043.31/ Dec, 1981**	1051.25/ Oct 1985 **1050.96/ Sep 2000**	dry/ Sep 24 (N/A) **1046.03/ Sep 24 (-2.66)**	1048.17/ Jun 6 (-0.42) **1048.34/ Jun 6 (-1.26)**	Normally an upward hydraulic gradient. Sub-zero temperatures at depth (thermistor CD-15) correlate with variable pressures at depth.
CD-21	1981	P	2	1053.45	1047.50/ **1042.00**	1047.92/ Apr 1991 **1042.28/ Nov 1988, May 1982 to Sep 1983**	1052.26/ Jun 1992 **1047.51/ Jun 1992**	1048.27/ Sep 24 (+0.14)	1048.69/ Sep 24 (+0.42)	Historically downward gradient, likely free drainage at depth. Pressures dropped in shallow piezometer from 1999 to 2003, stable from 2003 to 2005. Deep tip piezometer destroyed in 2005.
CD-26	1981	P	2	1053.1	1048.2/ **1042.0**	1048.2/ Sep 1995, Sep 2007 **1042.0/ Sep 1995**	1049.81/ Jul 1988 **1043.61/ Jul 1988**	1048.20 (dry)/ Sep 24 (-0.33) **1042.21/ Sep 24 (-0.28)**	1048.62/ Jun 6 (+0.07) **1042.70/ Jun 6 (+0.14)**	Downward gradient, likely free drainage at depth. Readings are very consistent since 2001.
BGC05-03 **BGC05-02**	2005	P	2	1054.68 **1054.1**	1050.64 **1044.65**	1050.64 /Sep 2007 **1045.21 / Sep 2007**	1050.99 /Oct 2006, Jun 2007 **1045.98 / Jun 2006**	1050.64 (dry)/Sep 24 (-0.21) **1045.21 / Sep 24 (-0.63)**	1050.99 /Jun 6 (0.00) **1045.05 / Jun 6 (+0.07)**	Replaced former piezometer CD-19. Downward gradient, likely free draining at depth.
BGC05-06	2005	P	2	1050.31	1046.78 **1041.50**	1046.78/ Sep 2007 **1041.50/ Sep 2007**	1046.99/ Jun 2007 **1041.78/ Jun 2007**	1046.78 (dry)/ Sep 24 (-0.14) **1041.50 (dry)/ Sep 24 (-0.21)**	1046.99/ Jun 6 (+0.07) **1041.78/ Jun 6 (+0.06)**	Downward gradient, likely free drainage at depth to dry condition. Replaced former piezometers 88-11.

Note: Bold values correspond to deep tip readings.

Table 5 Diversion Canal - Canal Dike - Thermistors

Installation	Date Installed	Length of String (m)	# of Readings in 2007	Depth to Permafrost 2006 (depth below ground surface (m))	Depth to Permafrost 2007 (depth below ground surface (m))	Comments
CD-10	1981	10	2	Not observed within 9.9 m of ground surface.	~5	Generally consistent temperature
CD-15	1981	10	2	9.5	Not observed within 9 m of ground surface.	Data from a node at 3m depth was not included in the analysis
CD-21	1981	13	2	Not observed within 13.0 m of ground surface.	Not observed within 13.0 m of ground surface.	Warming trend indicated at depth.
CD-26	1981	10	2	Not observed within upper 9.6 m of ground surface.	Not observed within upper 9.6 m of ground surface.	Warming trend indicated at depth.
BGC01-02	2001	13.9	2	Not observed within upper 13 m of ground surface.	Not observed within upper 13 m of ground surface.	Upper nodes malfunctioning. Warming trend at depth.
BGC05-04	2005	11.9	0	No readings available.	No readings available.	No readings taken since installation. Repair required. Replaced thermistor CD-19.
BGC05-07	2005	11.4	0	No readings available.	No readings available.	No readings taken since installation. Repair required. Replaced thermistor 88-11.

Table 6 Diversion Canal - Canal Dike - Slope Indicators

Installation	Date Installed	Length of Casing (m)	# of Readings in 2007	Comments
CD-10	1981	10	2	Minor but continued movement measured between 4 and 5 m depth.
CD-15	1981	10	2	Negligible subsurface movement since 1996. Minor surficial movement in upper 2 m.
91CD-1	1991	11	2	Negligible movement since 1996.
CD-19	1981	10	2	Some movement was detected in readings prior to 1998. This movement has previously been attributed to settlement of the dike and settlement of the SI casing in the borehole. Minor surficial movement in upper 2 m
CD-21	1981	10	2	Some movement was detected in readings prior to 1998. This movement has been attributed to settlement of the dike and settlement of the SI casing in the borehole. Indications of settlement have been observed at surface during the annual inspection since 1991.
BGC01-01 (88-10 replacement)	2001	11	2	Original depth of casing was 14 m bgs, frozen to 11.8 m in 2004. Frozen to 10 m in 2006. Makes interpretation difficult. Only minor movements in casing. Stop reading in 2008.
94CD-1	1994	14	2	Negligible subsurface movement since 1996. Surficial movements in upper 2 m.
BGC05-05	2005	11.5	2	Negligible movement in 2007, movement likely due to grout settlement.
BGC05-08	2005	12.5	2	Some minor upper creep recorded.

Table 7 Diversion Canal - Spoil Piles - Thermistors

Installation	Date Installed	Length of String (m)	# of Readings in 2007	Depth to Permafrost 2006 (m below surface)	Depth to Permafrost 2007 (m below surface)	Comments
SP-2	1981	10	2	Not observed with 10 m of ground surface	Not observed with 10 m of ground surface	Warming trend at depth
SP-3	1981	10	2	Not observed with 10 m of ground surface	Not observed with 10 m of ground surface	Apparent warming trend at depth.
SP-5	1981	10	2	Not read in 2006	Not observed to 10 m	Previously, permafrost was noted at 9 m depth, but now is not present

Table 8 Diversion Canal - Spoil Piles - Slope Inclinometers

Installation	Date Installed	Length of Casing (m)	# of Readings in 2007	Comments
SP-2	1981	7.5	2	Some settlement in the vicinity of SP-2, based on the distinctive shape of the deflection versus depth curves. Also some downslope movement noted in upper 2 m.
SP-5	1981	10	2	No movement at depth has been recorded since 1994. Minor surface displacements have been occurring in the upper 2 m since September 2000.

Table 9 Intermediate Dam - Piezometers

Installation	Date Installed	Standpipe (S) or Pneumatic (P)	# of Readings in 2007	Ground Elevation (m amsl)	Tip Elev. (m amsl)	Historic Low Reading/ Date	Historic High Reading/ Date	2007 Low Reading/ Date (Compared to 2006)	2007 High Reading/ Date (Compared to 2006)	Comments
BH91-ID3	1991	P	2	1043.82	1036.82/ **1028.62**	1036.82/ Sep 95, Dec 98, Sep 00, Sep 02, Sep 03, May 05, Sep 05, May 07 **1030.93/ Mar 2006**	1039.23/ Jun 1992 **1038.04/ Jun 1992**	1036.82/ May 22 (0.00) **1031.84/ May 22 (+0.91)**	1036.86/ Sep 26 (0.00) **1032.61/ Sep 26 (-0.88)**	Shallow tip readings dry or almost dry in 2006. Deep tip indicates declining pore pressures with high seasonal flucuation. Historically low readings Downward gradient.
BH91-ID4	1991	P	2	1031.8	1024.22/ **1017.08**	1028.28/ Sep 2007 **1027.23/ Mar 2006**	1034.58/ Jun 1992 **1031.85/ Sep 1992**	1028.28/ Sep 26 (-0.07) **1027.58/ Sep 26 (+0.35)**	1029.96/ May 22 (+1.34) **1028.84/ May 22 (+0.56)**	Downward gradient, declining pore pressures since 2002.
BH91-ID5	1991	P	2	1031.64	1024.3/ **1017.08**			1024.30/ Sep 26 (0.00) **1017.08/ Sep 26 (0.00)**	1024.86/ May 22 (+0.56) **1017.43/ May 22 (+0.35)**	Both tips are leaking, making the instrument inoperable. Tips should be replaced.
BH91-ID6	1991	P	2	1031.36	1024.8/ **1016.9**	1026.83/ May 1997 **1028.17/ Mar 2006**	1031.74/ Jun 1992 **1034.96/ Jun 1992**	1027.32/ Sep 26 (+0.14) **1028.52/ Sep 26 (+0.04)**	1028.58/ May 22 (+1.19) **1029.57/ May 22 (+1.19)**	Downward gradient. Pore pressures declining since 1999.
BH91-ID7	1991	P	2	1032.42	1025.95	1029.17/ Mar 2006	1032.20/ Feb 1992	1029.80/ Sep 26 (+0.63)	1030.36/ May 22 (+0.63)	Pore pressures appear to be declining since 1999.
BH94-IDC-1	1994	S	2	1049.21	1035.1 (approx)					Has recorded dry conditions since initial monitoring in 1994
BH96-1	1996	S	1	1049.15	1027.35	1027.85/ Oct 2006	1031.65/ Jun 1999	1028.18/ Sep 26 (+0.33)	1028.18/ Sep 26 (+0.33)	Piezometric Elev. Approx. 20 - 22 m bgs.
BH96-2	1996	S	2	1049.22	1028.87	1028.27/ May 10, 2004	1031.94/ Jun 1999	1028.54/ Sep 26 (-0.24)	1029.60/ May 22 (+0.69)	Piezometric Elev. Approx. 18 - 20 m bgs.
BH96-3	1996	S	2	1031.48	1022.43/ **1012.23**	1027.37/ Mar 2006 **1027.48/ Mar 2006**	1031.38/ Jun 1999 **1031.45/ Jun 1999**	1028.07/ Sep 26 (+0.30) **1028.13/ Sep 26 (+0.24)**	1029.84/ May 22 (+2.13) **1029.19/ May 22 (+0.61)**	Piezometric Elev. Approx. 3.0 - 5.0 m bgs. Historically low values were recorded in 2006
BH96-4	1996	S	2	1032.16	1025.68 1020.86 1015.69 **1003.82**	1027.61/Mar 2006 1028.41/ Jun 2006, May 2007 1027.74/ Mar 2006 **1027.73/ Mar 2006**	1032.04/ Jun 2002 1032.08/ Jun 2002 1031.64/ Jun 1999 **1031.75/ Jun 1999**	1028.20/ Sep 26 (+0.59) 1028.41/ May 22 (0.00) 1028.23/ Sep 26 (+0.49) **1028.34/ Sep 26 (+0.61)**	1029.96/ May 22 (-0.49) 1028.42/ Sep 26 (+0.01) 1031.55/ May 22 (+3.59) **1029.93/ May 22 (+1.87)**	Piezometric Elev. Approx. 2.5 - 4.5 m bgs. Historically low values were recorded in 2006
P01-03	2001	S	2	1031.52	1022.35	1027.75/ Mar 2006	1030.63/ Sep 2001	1028.12/ Sep 26 (+0.37)	1029.69/ May 22 (+1.62)	Piezometric Elev. Approx. 2.5 - 3.5 m bgs. Historic lows recorded in 2006.
P01-04	2001	S	2	1032.32	998.17/ **978.89**	1029.55/ Sep 2003 **1029.06/ Mar 2006**	1032.24/ May 2005 **1032.17/ May 2005**	1030.33/ Sep 26 (+0.41) **1029.77/ Sep 26 (+0.71)**	1031.95/ May 22 (+1.78) **1030.64/ May 22 (+0.46)**	Piezometric Elev. Approx. 0 - 3.0 m bgs; Historic lows recorded in 2006. Gradient small downward
BKS04-06	2004	S	2	1049.1	1036	1036.46/ Sep 2005	1037.60/ May 2005	1036.46/ Sep 26 (-0.01)	1036.75/ May 22 (-0.82)	Dry
BKS04-07	2004	S	2	1049.2	1037.3	1036.55/ Mar 2006	1037.72/ Sep 2005	1037.69/ Sep 26 (+1.14)	1048.68/ May 22 (+10.98)	Dry

Note: Bold values correspond to deep piezometer tips

Table 10 Cross Valley Dam 2007 Weir Flows

DATE	X13 (comb.) FLOW* (Lps)	X11 (North) FLOW* (Lps)	X12 (South) FLOW* (Lps)	W3 (Central) FLOW* (Lps)	X13-(X11+X12+W3) FLOW (Lps)
Jan. 04/07	**27.84**	**11.93**	**0.31**	**5.75**	10
Jan. 11/07	**29.14**	**15.14**	**0.31**	**5.49**	8
Jan. 16/07	**29.14**				Sampled
Jan. 18/07	**29.14**	**14.69**	**0.31**	**5.49**	9
Jan. 25/07	**27.84**	**14.24**	**0.31**	**5.49**	8
Feb. 01/07	**28.49**	**14.69**	**0.31**	**5.49**	8
Feb. 08/07	**28.49**	**14.69**	**0.31**	**5.49**	8
Feb. 15/07	**29.14**	**14.91**	**0.31**	**5.49**	8
Feb. 22/07	**29.14**	**14.91**	**0.31**	**5.62**	8
Mar. 08/07	**29.14**	**14.02**	**0.31**	**5.62**	9
Mar. 15/07	**27.84**	**14.02**	**0.31**	**6.14**	7
Mar. 22/07	**27.84**	**14.02**	**0.31**	**6.41**	7
Mar. 29/07	**27.84**	**14.02**	**0.31**	**6.14**	7
Apr. 05/07	**27.20**	**13.59**	**0.31**	**5.75**	8
Apr. 12/07	**24.08**	**10.96**	**0.31**	**5.49**	7
Apr. 19/07	**22.87**	**9.69**	**0.31**	**4.89**	8
Apr. 26/07	**24.08**	**10.96**	**0.31**	**5.25**	8
May 03/07	**24.69**	**11.73**	**0.31**	**5.49**	7
May 10/07	**25.94**	**14.24**	**0.31**	**5.75**	6
May 17/07	**24.69**	**14.02**	**0.31**	**5.75**	5
May 24/07	**24.69**	**14.02**	**0.77**	**5.75**	4
May 31/07	**25.94**	**14.46**	**0.77**	**5.75**	5
June 07/07	**26.57**	**14.02**	**0.77**	**6.14**	6
June 14/07	**30.45**	**15.14**	**0.93**	**4.66**	10
June 21/07	**34.51**	**15.14**	**1.06**	**4.78**	14
June 28/07		**16.32**	**1.21**	**5.49**	No read Trapping Beaver
July 05/07		**16.32**	**1.47**	**5.75**	No read Trapping Beaver
July 12/07	**33.82**	**15.14**	**1.65**	**5.49**	12
July 19/07	**33.82**	**15.14**	**1.65**	**5.49**	12
July 26/07	**33.12**	**14.02**	**1.78**	**5.49**	12
Aug. 02/07	**33.12**	**14.69**	**1.78**	**5.49**	11
Aug. 09/07	**33.12**	**18.82**	**1.47**	**4.89**	8
Aug.16/07	**26.57**	**10.59**	**1.65**	**4.33**	10
Aug. 23/07	**24.08**	**8.34**	**1.21**	**4.12**	10
Aug. 30/07	**22.87**	**7.56**	**1.21**	**3.81**	10
Sept. 06/07	**22.27**	**7.56**	**1.16**	**3.81**	10
Sept. 13/07	**23.47**	**7.41**	**1.11**	**3.81**	11
Sept. 20/07	**21.67**	**6.55**	**1.06**	**3.81**	10
Sept. 27/07	**21.67**	**6.27**	**1.06**	**3.81**	11

Table 10 Cross Valley Dam 2007 Weir Flows

DATE	X13 (comb.) FLOW* (Lps)	X11 (North) FLOW* (Lps)	X12 (South) FLOW* (Lps)	W3 (Central) FLOW* (Lps)	X13-(X11+X12+W3) FLOW (Lps)
Jan. 04/07	**27.84**	**11.93**	**0.31**	**5.75**	10
Jan. 11/07	**29.14**	**15.14**	**0.31**	**5.49**	8
Jan. 16/07	**29.14**				Sampled
Jan. 18/07	**29.14**	**14.69**	**0.31**	**5.49**	9
Jan. 25/07	**27.84**	**14.24**	**0.31**	**5.49**	8
Feb. 01/07	**28.49**	**14.69**	**0.31**	**5.49**	8
Feb. 08/07	**28.49**	**14.69**	**0.31**	**5.49**	8
Feb. 15/07	**29.14**	**14.91**	**0.31**	**5.49**	8
Feb. 22/07	**29.14**	**14.91**	**0.31**	**5.62**	8
Mar. 08/07	**29.14**	**14.02**	**0.31**	**5.62**	9
Mar. 15/07	**27.84**	**14.02**	**0.31**	**6.14**	7
Mar. 22/07	**27.84**	**14.02**	**0.31**	**6.41**	7
Mar. 29/07	**27.84**	**14.02**	**0.31**	**6.14**	7
Apr. 05/07	**27.20**	**13.59**	**0.31**	**5.75**	8
Apr. 12/07	**24.08**	**10.96**	**0.31**	**5.49**	7
Apr. 19/07	**22.87**	**9.69**	**0.31**	**4.89**	8
Apr. 26/07	**24.08**	**10.96**	**0.31**	**5.25**	8
May 03/07	**24.69**	**11.73**	**0.31**	**5.49**	7
May 10/07	**25.94**	**14.24**	**0.31**	**5.75**	6
May 17/07	**24.69**	**14.02**	**0.31**	**5.75**	5
May 24/07	**24.69**	**14.02**	**0.77**	**5.75**	4
May 31/07	**25.94**	**14.46**	**0.77**	**5.75**	5
June 07/07	**26.57**	**14.02**	**0.77**	**6.14**	6
June 14/07	**30.45**	**15.14**	**0.93**	**4.66**	10
June 21/07	**34.51**	**15.14**	**1.06**	**4.78**	14
June 28/07		**16.32**	**1.21**	**5.49**	No read Trapping Beaver
July 05/07		**16.32**	**1.47**	**5.75**	No read Trapping Beaver
July 12/07	**33.82**	**15.14**	**1.65**	**5.49**	12
July 19/07	**33.82**	**15.14**	**1.65**	**5.49**	12
July 26/07	**33.12**	**14.02**	**1.78**	**5.49**	12
Aug. 02/07	**33.12**	**14.69**	**1.78**	**5.49**	11
Aug. 09/07	**33.12**	**18.82**	**1.47**	**4.89**	8
Aug.16/07	**26.57**	**10.59**	**1.65**	**4.33**	10
Aug. 23/07	**24.08**	**8.34**	**1.21**	**4.12**	10
Aug. 30/07	**22.87**	**7.56**	**1.21**	**3.81**	10
Sept. 06/07	**22.27**	**7.56**	**1.16**	**3.81**	10
Sept. 13/07	**23.47**	**7.41**	**1.11**	**3.81**	11
Sept. 20/07	**21.67**	**6.55**	**1.06**	**3.81**	10
Sept. 27/07	**21.67**	**6.27**	**1.06**	**3.81**	11

Continued on next page

Table 10 Cross Valley Dam 2007 Weir Flows (Continued)

DATE	X13 (comb.) FLOW* (Lps)	X11 (North) FLOW* (Lps)	X12 (South) FLOW* (Lps)	W3 (Central) FLOW* (Lps)	X13-(X11+X12+W3) FLOW (Lps)
Oct. 04/07	**21.67**	**5.75**	**1.06**	**3.81**	11
Oct. 11/07	**21.67**	**7.56**	**1.06**	**3.81**	9
Oct. 18/07	**23.47**	**8.34**	**0.97**	**3.81**	10
Oct. 25/07	**23.47**	**8.34**	**0.97**	**3.81**	10
Nov. 01/07	**23.47**	**8.34**	**1.06**	**3.81**	10
Nov. 08/07	**23.47**	**8.34**	**1.06**	**3.81**	10
Nov. 15/07	**23.47**	**8.34**	**0.84**	**3.81**	10
Nov. 22/07	**24.08**	**8.50**	**0.77**	**4.01**	11
Nov. 29/07	**24.69**	**10.96**	**0.77**	**4.01**	9
Dec. 06/07	**24.69**		**0.77**	**4.01**	20
Dec. 13/07	**24.08**	**10.77**	**0.77**	**4.78**	8
Dec. 20/07	**24.08**	**10.96**	**0.77**	**4.78**	8
Dec. 27/07	**24.08**	**10.96**	**0.77**	**4.78**	8
	*Flows calculated from standard weir formulas and applied to staff gauge levels. Staff levels prior to September 2, 2005 corrected according to Laberge Environmental Services (2005). The difference of flow at X13 less (X11+X12+W3) is due additional seepage discharge beyond the other three weirs				
Average	26.45	12.02	0.81	4.95	9
Max	34.51	18.82	1.78	6.41	20
Min	21.67	5.75	0.31	3.81	4

Table 12 Cross Valley Dam - Piezometers

Installation	Date Installed	Standpipe (S) or Pneumatic (P)	# of Readings in 2007	Ground Elevation (m amsl)	Tip Elev. (m amsl)	Historic Low Reading/ Date	Historic High Reading/ Date	2007 Low Reading/ Date (Compared to 2006 Low)	2007 High Reading/ Date (Compared to 2006 High)	Comments
CVDC-4	1981	S	2	1033.30	1007.9/ **999.7**	1016.68/ Apr 1984 **1016.72/ Apr 1984**	1018.44/ Oct 1986 **1019.05/ Jun 1992**	N/A **1018.39/ Sep 24 (+0.01)**	N/A **1018.75/ May 9 (+0.29)**	Shallow piezometer blocked 7.6 m below top of pipe since 1987. Deep piezometer has been very consistent since 1992.
CVDC-7	1981	S	2	1033.24	1007.80/ **1002.90**	1015.14/ Mar 2006 **1017.17/ Mar 2006**	1016.30/ Sep 1992 **1019.21/ Jun 1992**	1015.35/ May 9 (+0.21) **1017.50/ Sep 24 (+0.33)**	1015.36/ Sep 24 (+0.07) **1017.67/ May 9 (+0.23)**	Very consistent readings in both piezometers. Upward gradient.
CVDC-9	1981	S	2	1033.28	1007.70/ **1000.70**	1019.91/ Aug 1983 **1021.18/ Jun 1984**	1024.74/ Aug 1982 **1025.61/ Jun 1992**	1020.79/ Sep 24 (+0.51) **1023.32/ Sep 24 (+0.78)**	1021.03/ May 9 (+0.34) **1023.64/ May 9 (+0.57)**	Moderately higher pore pressures than in other parts of the dam. Slight upward gradient.
CVDP-1	1982	P	2	1016.86	1014.51	1017.38/ Aug 1983	1019.55/ Sep 1992	1017.52/ Sep 24 (-0.35)	1018.43/ May 9 (+0.35)	Minor seasonal fluctuations, artesian conditions
CVDP-2	1982	P	2	1016.86	1014.51	1015.14/ Mar 2006	1019.44/ Oct 1986	1015.42/Sep 24 (+0.28)	1015.63/May 9 (+0.21)	Readings do not seem reliable, piezometer may still be broken
CVDP-3	1982	P	2	1016.86	1014.71	1014.99/ Sep 1992	1018.07/ May 1991	1016.11/ Sep 24 (-0.14)	1016.39/ May 9 (+0.07)	Minor seasonal fluctuations, pore pressures at grade.
CVDP-5	1982	P	2	1019.18	1014.28	1018.13/ Aug 1983	1021.21/ Sep 1992	1019.53/ Sep 24 (-0.35)	1020.72/ May 9 (+0.56)	Artesian conditions
CVDP-6	1982	P	2	1019.18	1014.37	1016.99/ May 1998	1018.99/ Sep 1992	1017.38/ Sep 24 (0.00)	1017.73/ May 9 (+0.21)	Stable seasonally, Low pore pressures in the shallow foundation area.
CVDT-1	1994	S	2	1018.30	1007.9	1017.13/ May 1994	1018.32/ Aug 2004	1017.89/ Sep 24 (+0.02)	1018.25/ May 9 (+0.22)	Minor seasonal fluctuation.
CVDT-2	1994	S	2	1019.50	1006.2	1015.33/ Mar 2006	1016.49/ Oct 2000	1015.56/ May 9 (+0.23)	1015.60/ Sep 24 (-0.57)	Minor seasonal fluctuation, 3.5 m below grade. Historic Low in 2006.
94CVDC-1	1994	S	2	1033.38	1020.4	1022.73/ Mar 2006	1024.58/ Sep 1995	1022.99/ Sep 24 (+0.26)	1023.48/ May 9 (-0.39)	Minor seasonal fluctuation.
P01-11	2001	S	2	1017.21	1006.61	1016.71/ Mar 2006	1017.83/ Jul 2003	1016.84/ Sep 24, May 9 (+0.13)	1016.84/ Sep 24, May 9 (+0.02)	Piezometric elevation located just below ground surface. Minor seasonal fluctuation.

Note: Bold values correspond to deep tip readings

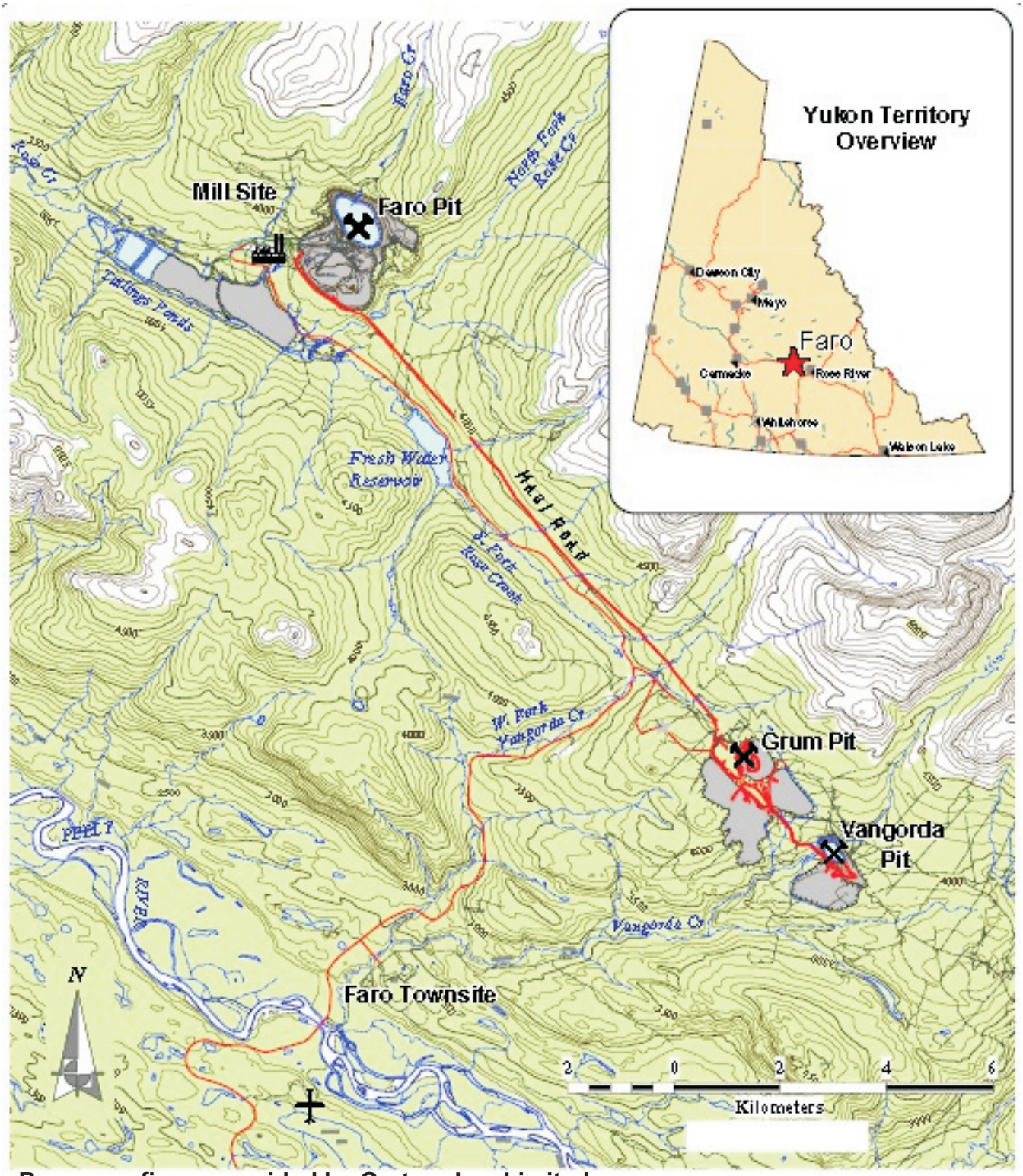
Table 13 Cross Valley Dam - Thermistors

Installation	Date Installed	Length of String (m)	# of Readings in 2007	Depth to Permafrost 2006 (m below ground surface)	Depth to Permafrost 2007 (m below ground surface)	Comments
CVDC-6	1981	29	2	N/A	N/A	Readings at 21 and 29 m are unavailable. Temperatures in the whole profile have been between 2 and 3°C since 1995
88-4-4T	1988	4.2	2	N/A	N/A	Depth of winter frost extends to approximately 4 m.

Table 14 Secondary Dam - Piezometers

Installation	Date Installed	Standpipe (S) or Pneumatic (P)	# of Readings in 2007	Ground Elevation (m amsl)	Tip Elev. (m amsl)	Historic Low Reading/ Date	Historic High Reading/ Date	2007 Low Reading/ Date (Compared to 2006)	2007 High Reading/ Date (Compared to 2006)	Comments
P03-01	2003	S	2	1060.58	9 Tips, Variable Depths	1054.54/ Sep 2007	1055.06/ Jun 2005	1054.54/ Sep 26 (-0.01)	1054.66/ Jun 6 (+0.11)	Gartner Lee monitoring well, 9 tips at varying elevations. Hydrostatic conditions.
P03-02	2003	S	2	1059.91	9 Tips, Variable Depths	1054.72/ Oct 2006	1058.35/ Jun 2007	1054.64/ Sep 26 (-0.08)	1058.35/ Jun 6 (+3.63)	Gartner Lee monitoring well, 9 tips at varying elevations. Hydrostatic conditions.
P03-03	2003	S	2	1060.67	9 Tips, Variable Depths	1057.87/ Oct 2006	1060.27/ Jun & Sep 2007	1060.27/ Jun 6, Sep 26 (+2.98)	1060.27/ Jun 6, Sep 26 (+2.98)	Gartner Lee monitoring well, 9 tips at varying elevations. Hydrostatic conditions.
P03-04	2003		2	1060.43				1057.47/ Jun 6, Sep 26 (-0.40)	1057.47/ Jun 6, Sep 26 (-0.40)	
P81-06	1981	S	2	1060.74	1054.71	1054.71/ Aug 2005	1054.74/ Jun & Sep 2007	1054.74/ Jun 6, Sep 26 (+0.01)	1054.74/ Jun 6, Sep 26 (+0.01)	Piezometric levels near bottom of standpipe or dry.
P81-07	1981	S	2	1063.31	1057.17	1057.17/ 2005 , 2006, Jun & Sep 2007	1057.18/ Sep 2007	1057.17/ Jun 6 (0.00)	1057.18/ Sep 26 (+0.01)	Piezometer dry.
P81-08	1981	S	2	1063.26	1055.8	1055.80/ Aug 2005, Jun & Sep 2007	1055.81/ 2005 and 2006	1055.80/ Jun 6, Sep 26 (-0.01)	1055.80/ Jun 6, Sep 26 (-0.01)	Piezometric levels near bottom of standpipe or dry.

FIGURES



Note: Base map figure provided by Gartner Lee Limited.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

SCALE:	As Shown	DESIGNED:	BFA
DATE:	FEBRUARY 2008	CHECKED:	GWF
DRAWN:	SLF	APPROVED:	JWC

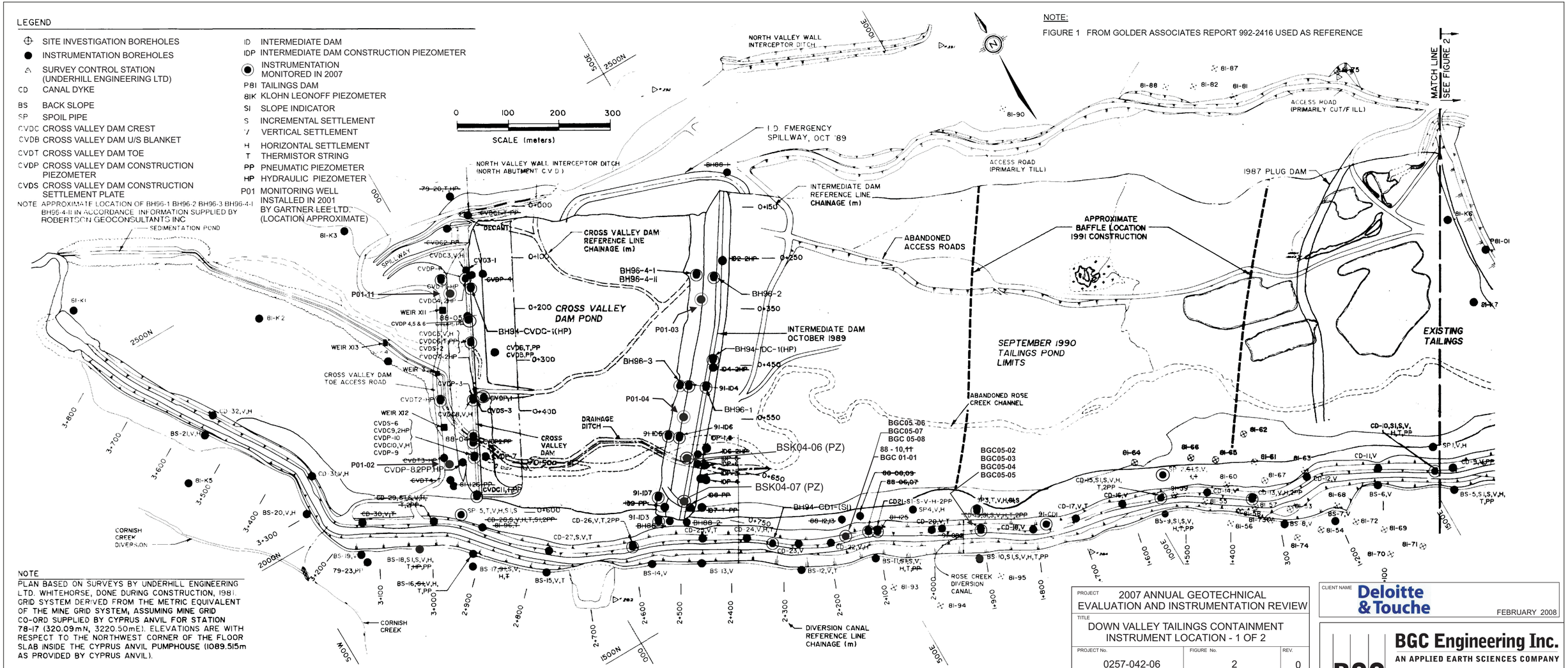
CLIENT: Deloitte & Touche

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary, Alberta. Phone: (403) 250-5185

PROJECT: 2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW

TITLE: SITE LOCATION PLAN

PROJECT No.	FIGURE No.	REV.
0257-042-06	1	0

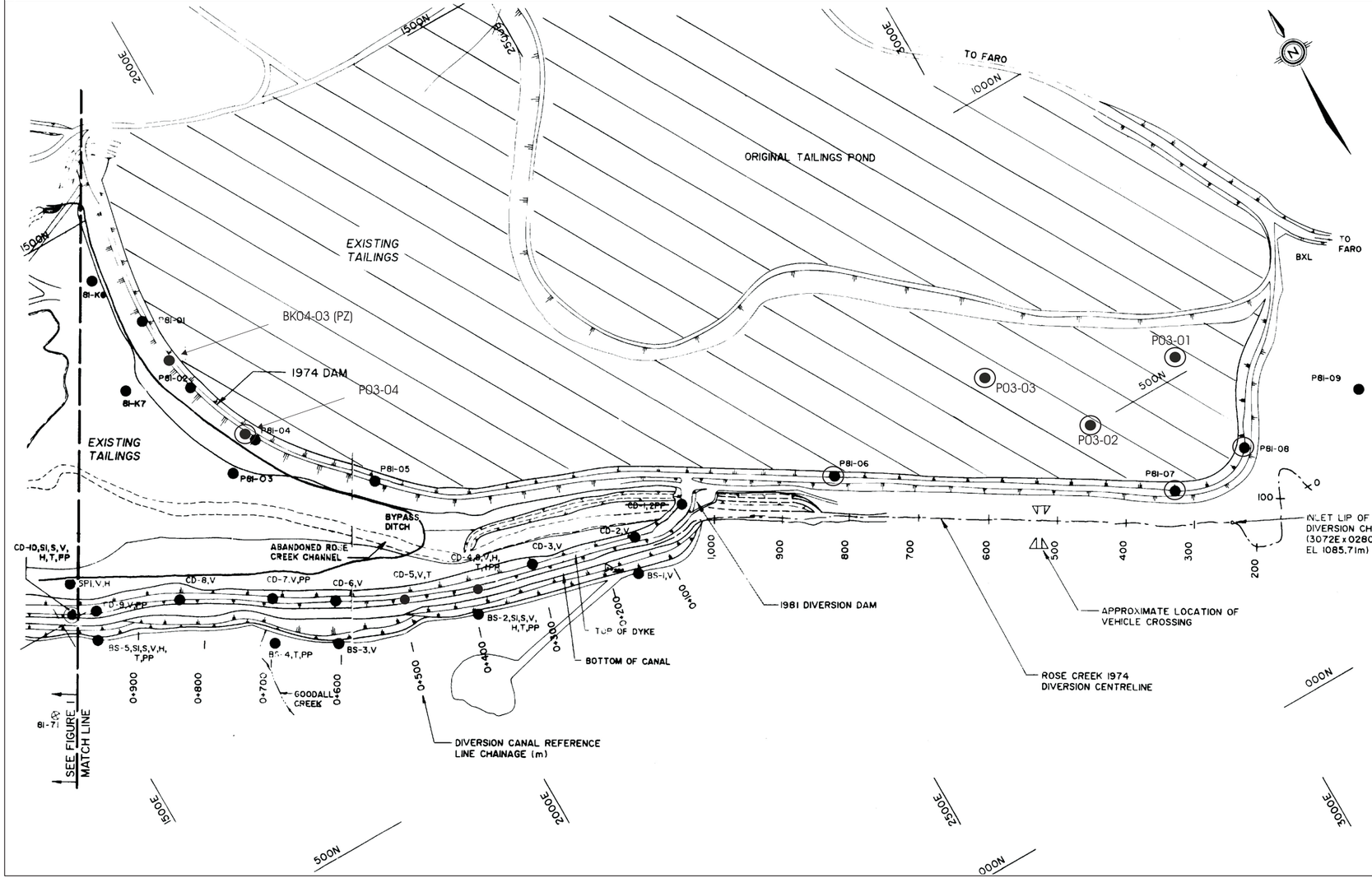


PROJECT	2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW
TITLE	DOWN VALLEY TAILINGS CONTAINMENT INSTRUMENT LOCATION - 1 OF 2
PROJECT No.	0257-042-06
FIGURE No.	2
REV.	0

CLIENT NAME Deloitte & Touche

FEBRUARY 2008

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary, AB Phone: (403) 250 5185



LEGEND

- SITE INVESTIGATION BOREHOLES
- INSTRUMENTATION BOREHOLES
- SURVEY CONTROL STATION (UNDERHILL ENGINEERING LTD)
- CD CANAL DYKE
- BS BACK SLOPE
- SP SPOIL PIPE
- CVDC CROSS VALLEY DAM CREST
- CVDB CROSS VALLEY DAM U/S BLANKET
- CVDT CROSS VALLEY DAM TOE
- CVDP CROSS VALLEY DAM CONSTRUCTION PIEZOMETER
- CVDS CROSS VALLEY DAM CONSTRUCTION SETTLEMENT PLATE
- INSTRUMENTATION MONITORED IN 2007
- ID INTERMEDIATE DAM
- IDP INTERMEDIATE DAM CONSTRUCTION PIEZOMETER
- P8I TAILINGS DAM
- 8IK KLOHN LEONOFF PIEZOMETER
- SI SLOPE INDICATOR
- S INCREMENTAL SETTLEMENT
- V VERTICAL SETTLEMENT
- H HORIZONTAL SETTLEMENT
- T THERMISTOR STRING
- PP PNEUMATIC PIEZOMETER
- HP HYDRAULIC PIEZOMETER
- P01 MONITORING WELL INSTALLED IN 2001 BY GARTNER LEE LTD. (LOCATION APPROXIMATE)
- P03 MONITORING WELL INSTALLED IN 2003 BY GARTNER LEE LTD. (LOCATION APPROXIMATE)

NOTE

PLAN BASED ON SURVEYS BY UNDERHILL ENGINEERING LTD. WHITEHORSE, DONE DURING CONSTRUCTION, 1981. GRID SYSTEM DERIVED FROM THE METRIC EQUIVALENT OF THE MINE GRID SYSTEM, ASSUMING MINE GRID CO-ORD SUPPLIED BY CYPRUS ANVIL FOR STATION 78-17 (320.09mN, 3220.50mE). ELEVATIONS ARE WITH RESPECT TO THE NORTHWEST CORNER OF THE FLOOR SLAB INSIDE THE CYPRUS ANVIL PUMPHOUSE (1089.515m AS PROVODED BY CYPRUS ANVIL).

FIGURE 2 FROM GOLDER ASSOCIATES REPORT 992-2416 USED AS REFERENCE

CLIENT: Deloitte & Touche

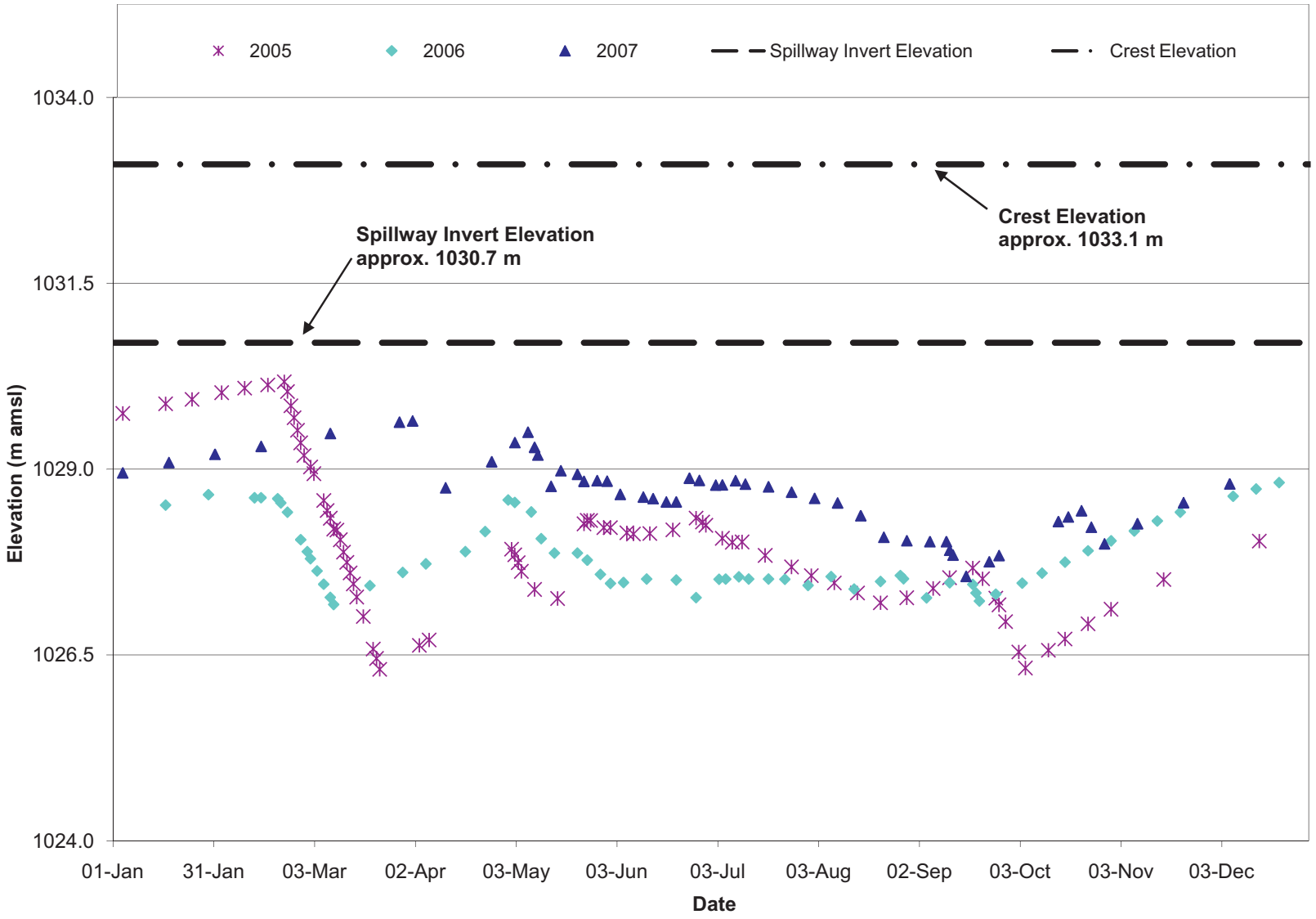
SCALE:	AS SHOWN
DATE:	FEBRUARY 2008
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT: 2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW

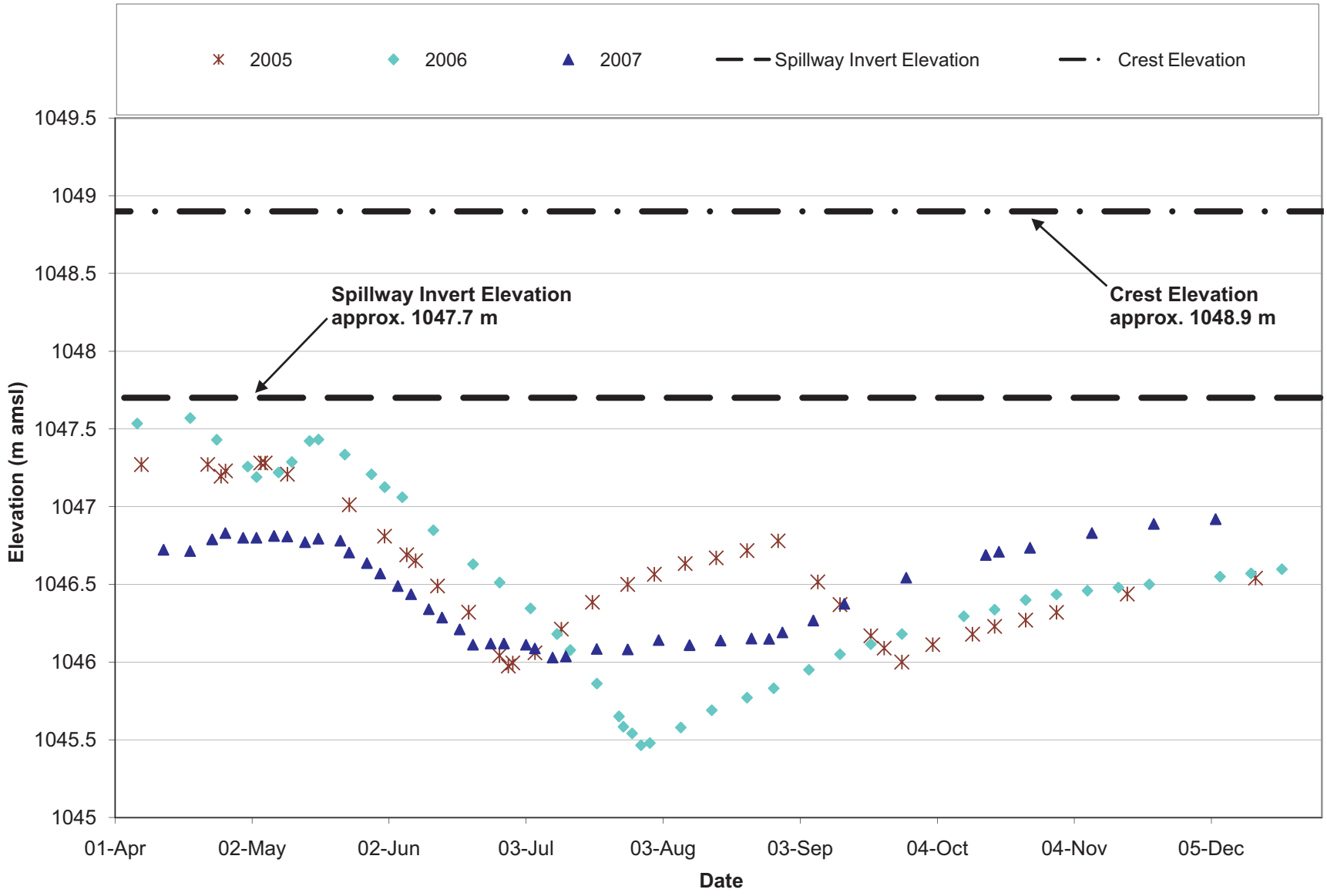
TITLE: DOWN VALLEY TAILINGS CONTAINMENT INSTRUMENT LOCATION - 2 OF 2

PROJECT No.	FIGURE No.	REV.
0257-042-06	3	0

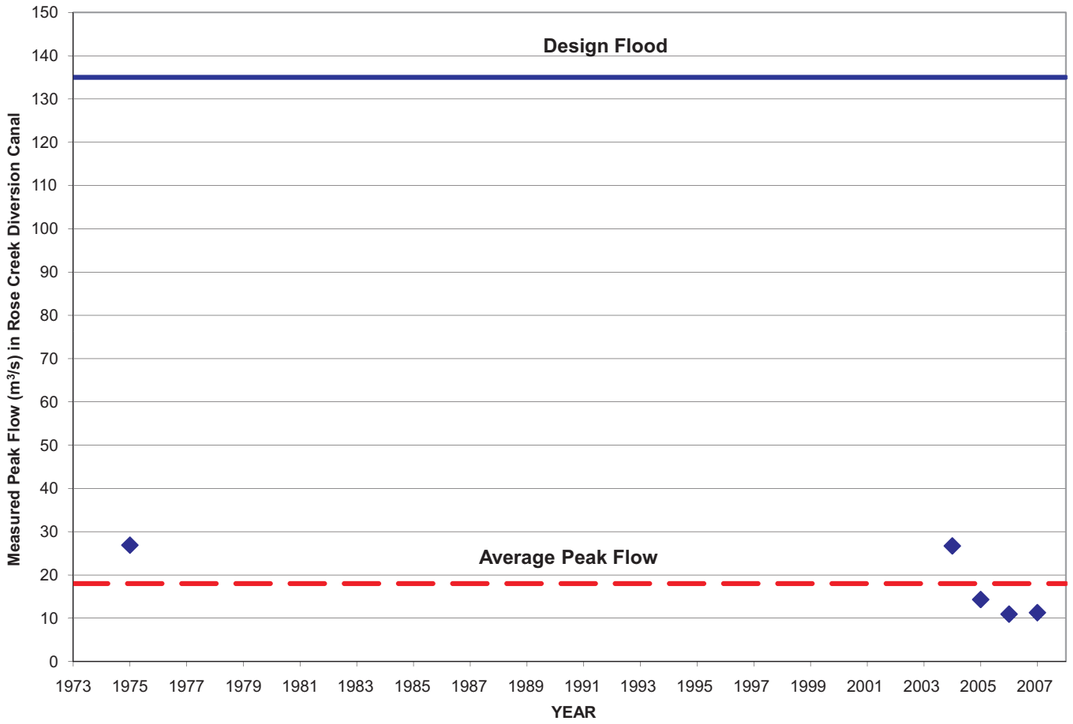
BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary, AB
Phone: (403) 250 5185

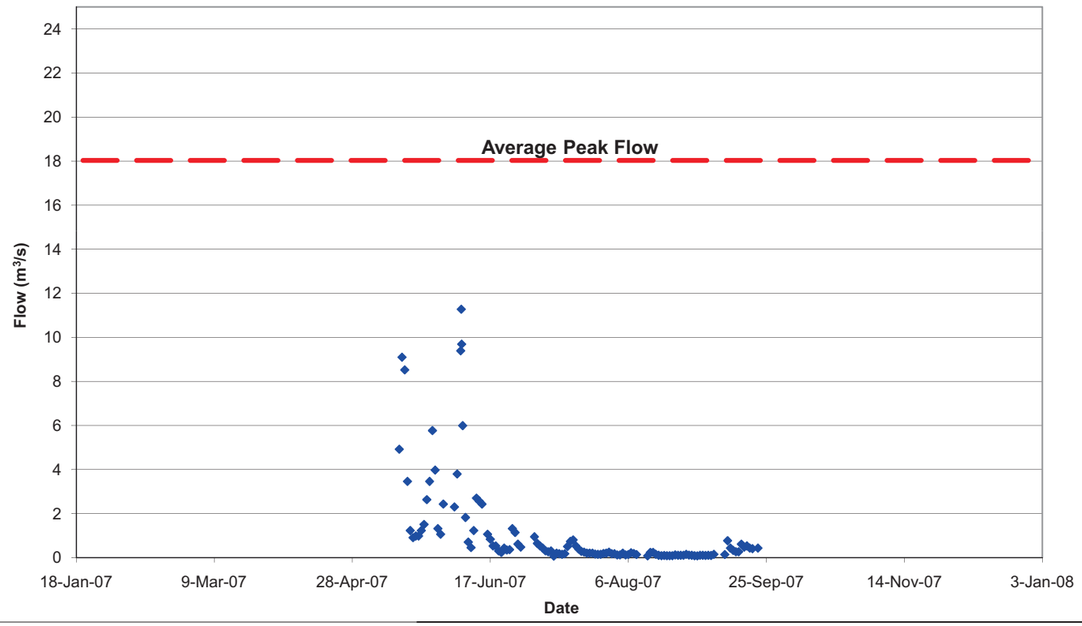


DATE: FEB 2008	DRAWN SLF	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY Calgary, Alberta Phone: (403) 250-5185	PROJECT 2007 ANNUAL GEOTECHNICAL EVALUATION & INSTRUMENTATION REVIEW	
REFERENCED DRAWING DESCRIPTION			TITLE CROSS VALLEY DAM POND ELEVATIONS (2005-2007)	
AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.		CLIENT Deloitte & Touche	PROJECT No. 0257-042-06	FIGURE No. 4 / REV. 0



DATE: FEB 2008	DRAWN SLF	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY Calgary, Alberta Phone: (403) 250-5185	PROJECT 2007 ANNUAL GEOTECHNICAL EVALUATION & INSTRUMENTATION REVIEW
REFERENCED DRAWING DESCRIPTION			TITLE INTERMEDIATE DAM POND ELEVATIONS (2005-2007)
AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.		CLIENT Deloitte & Touche	PROJECT No. 0257-042-06 / FIGURE No. 5 / REV. 0





CLIENT:

Deloitte & Touche

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT

2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW

TITLE

ROSE CREEK DIVERSION FLOW

PROJECT No.	FIGURE No.	REV.
0257-042-06	6	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta
Phone: (403) 250-5185



September: shows the water flowing in the channel section, looking in the downstream direction from downstream of the Diversion Dam.



June: shows a view of the channel with bedrock forming the uphill bank of the channel. In addition, we can see where the ice has been frozen on to the bedrock from a higher water level during the winter.



September: shows where some ice is just starting form in slower moving sections of the channel.



June: shows another section of the backslope. No sloughs or deformation are noted and there is a good consistent grade to the backslope.

CLIENT:

Deloitte & Touche

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
.	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT
2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENATION REVIEW

TITLE
DIVERSION CANAL DIKE INSPECTION PHOTOS

PROJECT No.	FIGURE No.	REV.
0257-042-06	7	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta
Phone: (403) 250-5185



June: shows a view of the channel with bedrock on the left side and riprap on the right side. No signs of slough or deformation at the top of the slope.



September: a view of the channel looking in the downstream direction just upstream from the Intermediate Dam. There does not appear to be any obvious concerns with the canal dike crest or the backslope .



June: a view of the backslope where previous repairs have been performed. No signs of new sloughing or deformation occurring.



September: shows the start of the upper weir section within the Rose Creek Diversion canal.

CLIENT:

Deloitte & Touche

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT
2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENATION REVIEW

TITLE
DIVERSION CANAL DIKE INSPECTION PHOTOS

PROJECT No.	FIGURE No.	REV.
0257-042-06	8	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta
Phone: (403) 250-5185



September: View of the left bank riprap in lower weir section, this is where Severin Creek enters the Diversion Canal.



September: Looking upstream in the upper weir section towards Cornish Creek.



September: The condition of the lower most weir in the lower weir section.



September: Condition of one of the weir crests in the upper weir section.

CLIENT:

Deloitte & Touche

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

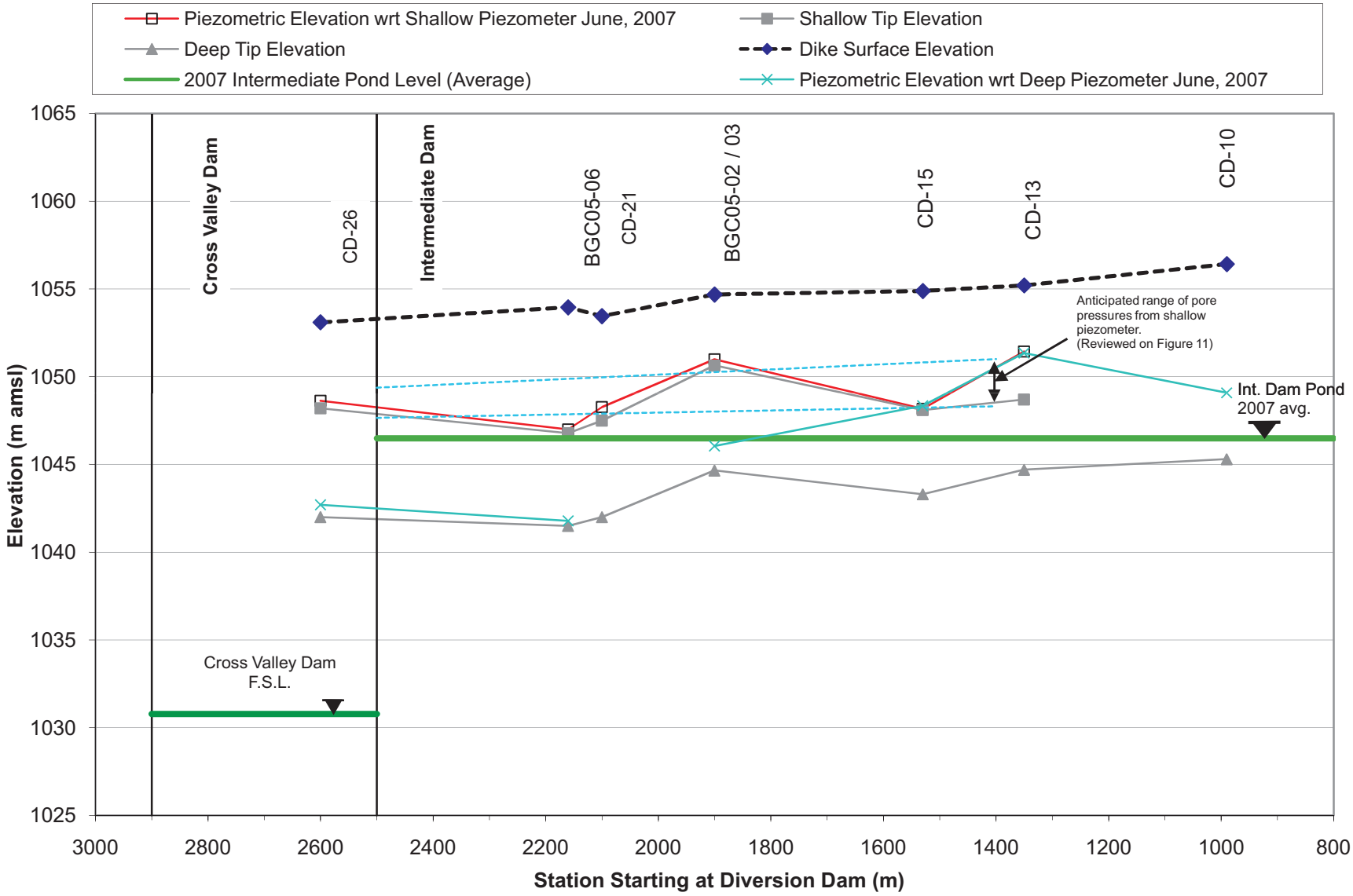
SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT
2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW

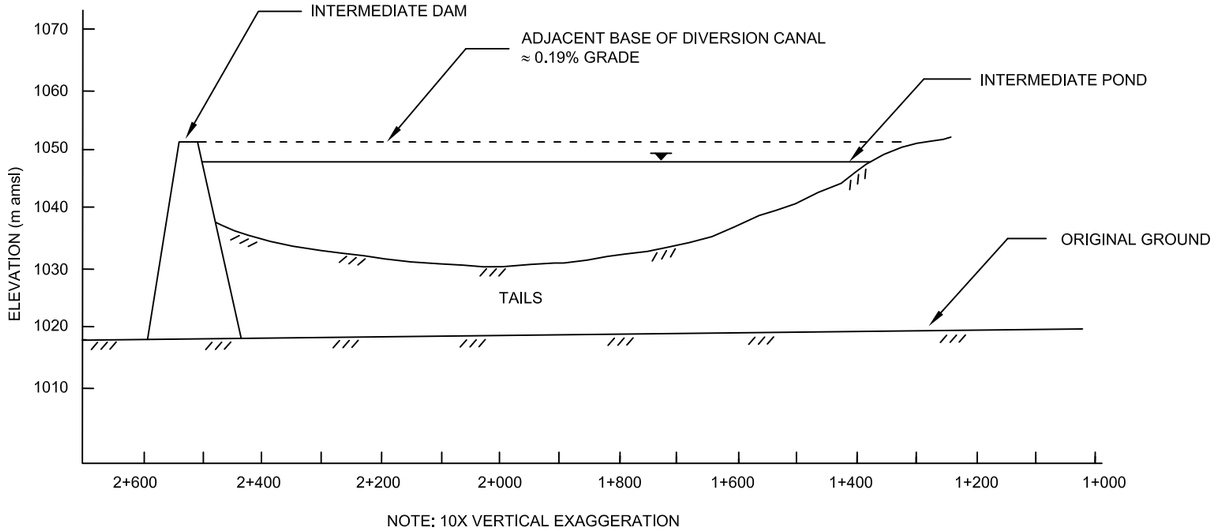
TITLE
DIVERSION CANAL INSPECTION PHOTOS - WEIR SECTIONS

PROJECT No.	FIGURE No.	REV.
0257-042-06	9	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta
Phone: (403) 250-5185



DATE: FEB 2008	DRAWN SLF	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY Calgary, Alberta Phone: (403) 250-5185	PROJECT 2007 ANNUAL GEOTECHNICAL EVALUATION & INSTRUMENTATION REVIEW	
AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.			TITLE CANAL DIKE, CURRENT PIEZOMETRIC CONDITIONS	
		CLIENT Deloitte & Touche	PROJECT No. 0257-042-06	FIGURE No. 10 / REV. 0



NOTE: 10X VERTICAL EXAGGERATION

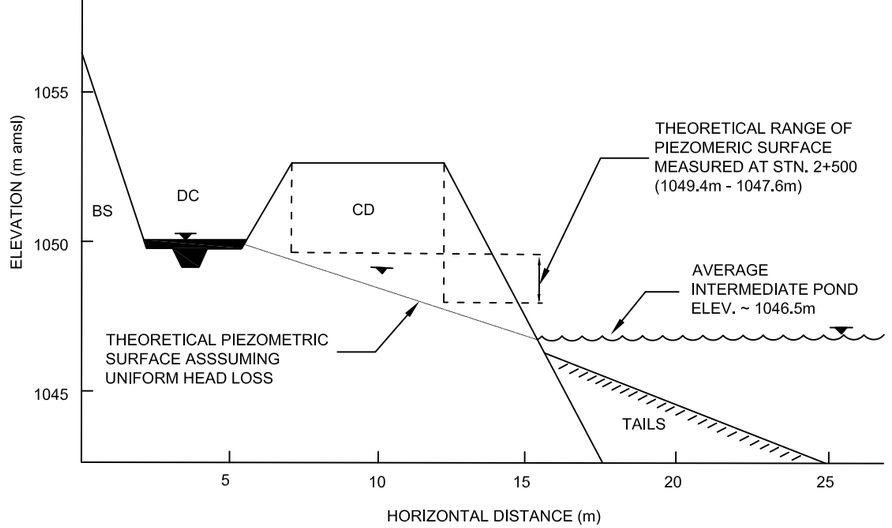
NOTES: 1) DRAWING IS A SCHEMATIC, CONSTRUCTED FOR ILLUSTRATIVE PURPOSES ONLY.

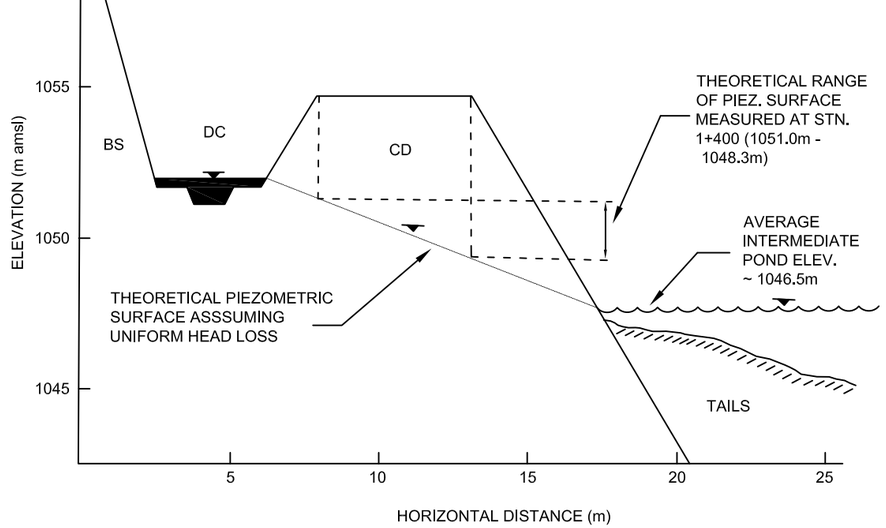
2) ALL ELEVATIONS ARE APPROXIMATE AND ARE BASED ON AVAILABLE INFORMATION.

3) LOCATION OF TAILINGS IN THE INTERMEDIATE POND IS APPROXIMATE. NO BATHYMETRIC INFORMATION IS AVAILABLE.

LEGEND

BS BACK SLOPE
DC DIVERSION CANAL
CD CANAL DIKE





AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECK	APPR.

SCALE: AS SHOWN
DATE: FEBRUARY 2008
DRAWN: JL
DESIGNED: BFA
CHECKED: GWF
APPROVED: JWC

PROFESSIONAL SEAL:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

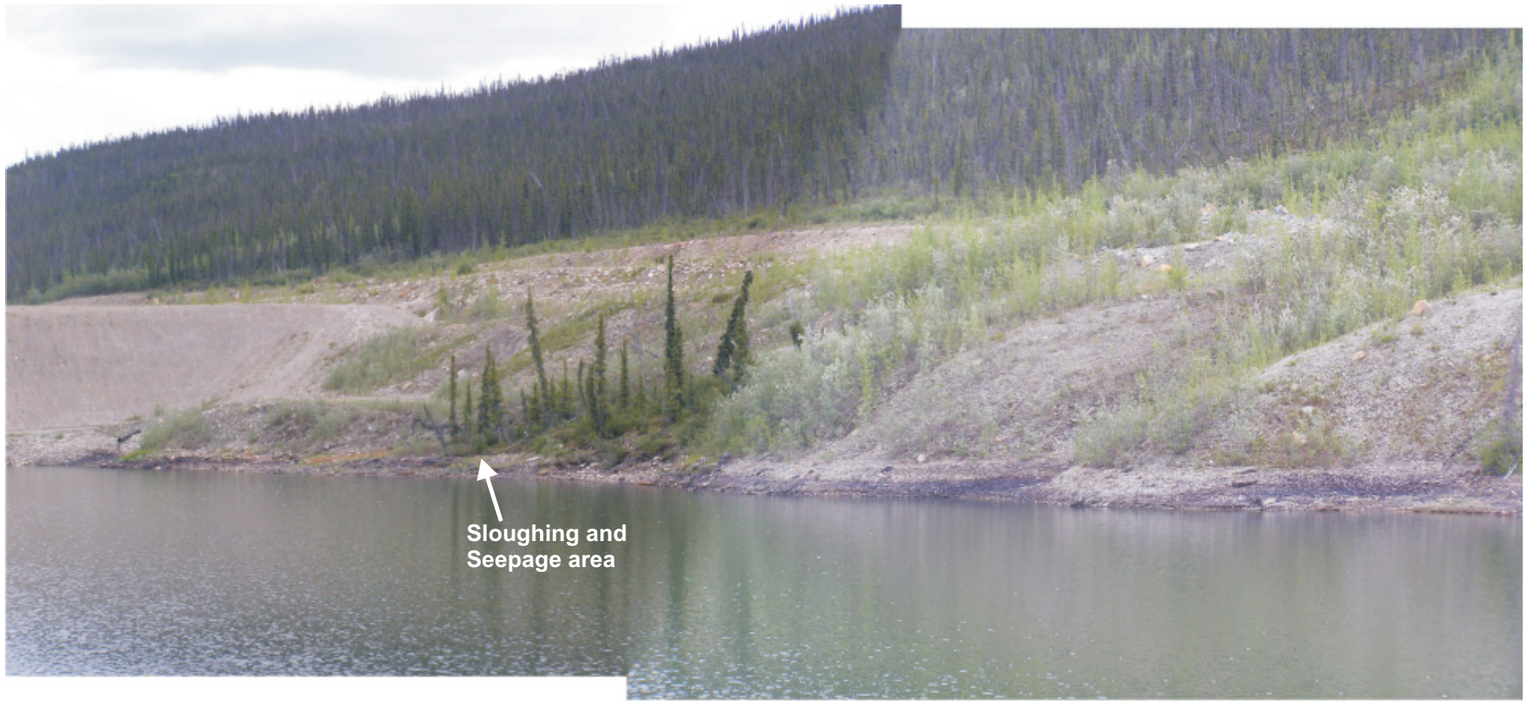
CLIENT: Deloitte & Touche

PROJECT: 2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW

TITLE: CANAL DIKE / INTERMEDIATE POND HYDRAULIC CONNECTIVITY

PROJECT No.:	DWG No.	REV.:
0257-042-06	11	0

K:\Projects\0257 DAT\042 2007 Faro Annual\06 Annual Geotech Inspection Report\Graphics\Drawings\0257-042-06 Fig 11.dwg Layout: Figure 11 Plot Date: Feb 21 08 Time: 9:40 AM



June: is a panoramic showing the toe of the spoil piles just east of the Cross Valley Dam. The Intermediate Dam is shown on the left side of this photo.



June: a panoramic close-up showing the sloughing and seepage area, looking towards the Cross Valley Dam.

CLIENT:

Deloitte & Touche

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT
2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENATION REVIEW

TITLE
SPOIL PILE INSPECTION PHOTOS

PROJECT No.	FIGURE No.	REV.
0257-042-06	12	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta
Phone: (403) 250-5185



September: shows the start of the north Valley Interceptor Ditch just uphill from the guard house gate. This is in the area the dike was repaired before and the riprap is obvious on the right hand side of the photo. To the walk along this distance the channel appears to be flowing quite well with no signs of erosion or blockages.



June: a view of the water flow in the channel upstream of the inlet. The water is currently slightly turbid. Note that some ice remains in the culvert.



September: shows where the Interceptor Ditch comes up against the berm located proximal to the access road. We can see here that the water is adequately defected and there does not appear to be any signs of erosion or deformation on this berm.



June: shows the channel below the outfall section.

CLIENT:

Deloitte & Touche

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT
2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENATION REVIEW

TITLE
NORTH VALLEY INTERCEPTOR DITCH INSPECTION PHOTOS

PROJECT No.	FIGURE No.	REV.
0257-042-06	13	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta
Phone: (403) 250-5185



June: the reservoir on the upstream side. The reservoir is about 2 to 2.5 m below the crest of the dam.



June: shows the upstream side. From the crest to the water level is approximately 2.3 to 2.5 m. Note that some small vegetation is growing on the upstream face of the dam.



September: shows a view of the upstream face following the July repairs to the riprap.



June: shows a view of the discharge from the mill water treatment facility.

CLIENT:

Deloitte & Touche

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT
2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENATION REVIEW

TITLE
INTERMEDIATE DAM INSPECTION PHOTOS

PROJECT No.	FIGURE No.	REV.
0257-042-06	14	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta
Phone: (403) 250-5185



June: the crest and the downstream face. Minor erosional gullies on the downstream side.



June: shows three slump features. These are likely related to removal of seasonal frost.



June: shows the erosional gullies on the downstream face of the dam.



September: shows a number of small erosional gullies located in the downstream face, looking towards the crest from the toe.

CLIENT:

Deloitte & Touche

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT
2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW

TITLE
INTERMEDIATE DAM INSPECTION PHOTOS

PROJECT No.	FIGURE No.	REV.
0257-042-06	15	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta
Phone: (403) 250-5185



June: shows a view of the crest looking towards the north abutment. The vegetation should be noted. No signs of deformation or cracking were noted across the crest.



September: shows the intersection of the downstream face with the north abutment. As can be seen, a bunch of vegetation in this area has been scrubbed out and the area has been graded for construction access.



June: shows the toe at the south abutment. No signs of seepage are noted at the current time, this is an area where seepage is historically noted.



September: is a view of the crest. At the current time there is no vegetation on the crest or the crest edge following its removal by site staff. There is some rutting and vehicle tracks on the crest.

CLIENT:

Deloitte & Touche

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT
2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW

TITLE
INTERMEDIATE DAM INSPECTION PHOTOS

PROJECT No.	FIGURE No.	REV.
0257-042-06	16	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta
Phone: (403) 250-5185



September: shows the upstream face. this shows the condition of the upstream side following vegetation removal and riprap repairs undertaken in 2007.



September: shows the small berm which has been formed on the upstream side the crest, likely during placement of additional riprap. This small berm should be graded down to prevent any water erosion effects.



September: shows the new riprap on the upstream side.



September: shows the downstream face of the Intermediate Dam. The difference in the snow cover between the erosional gully area and the now cleared drain area is obvious.

CLIENT:

Deloitte & Touche

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

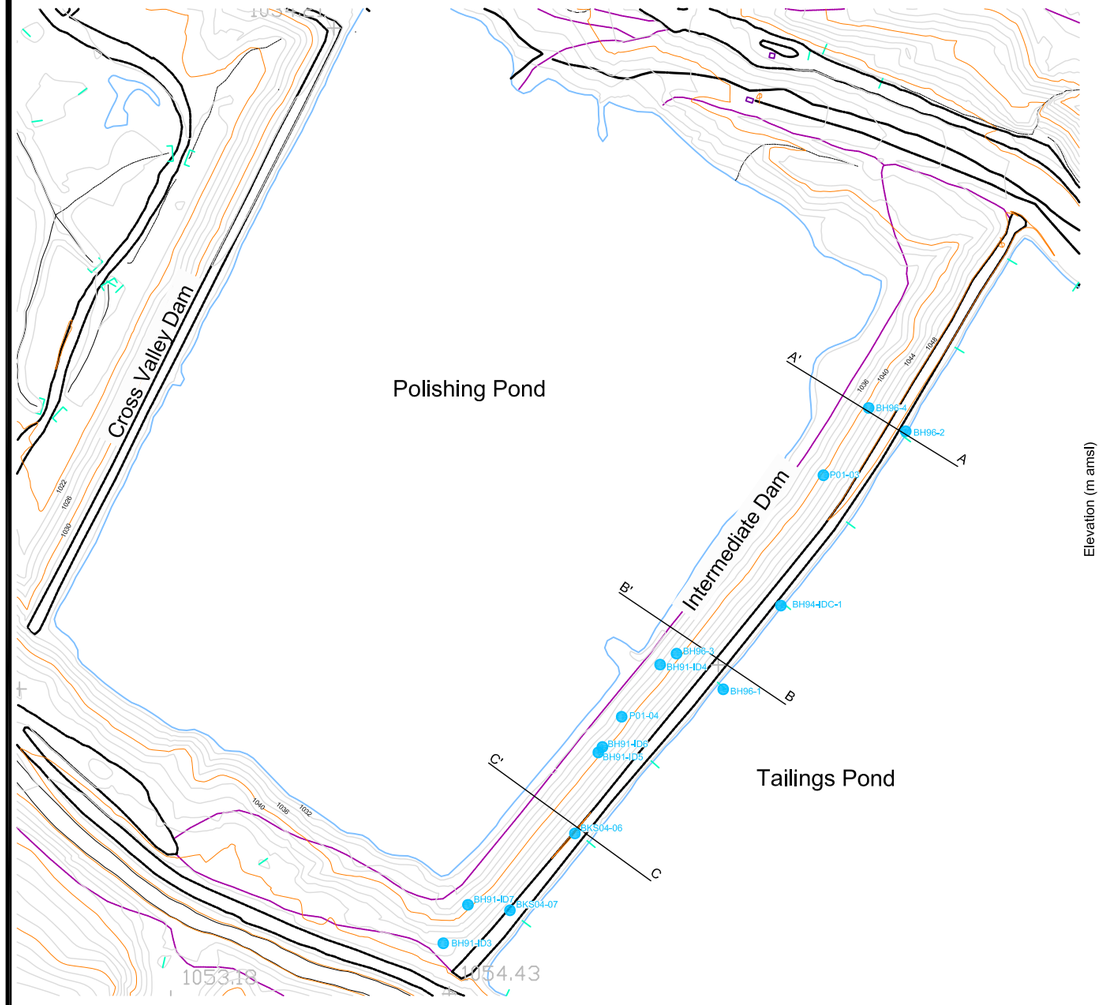
SCALE:	N/A
DATE:	FEBRUARY 2007
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT
2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENATION REVIEW

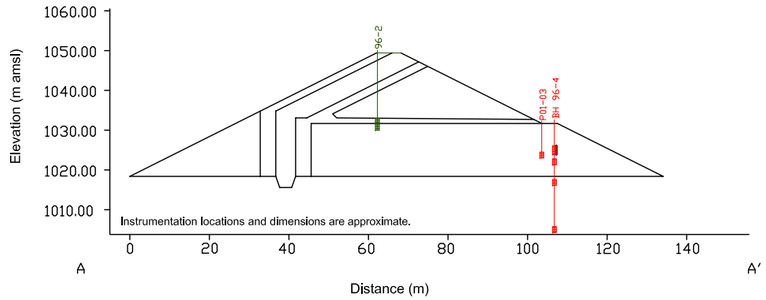
TITLE
INTERMEDIATE DAM INSPECTION PHOTOS

PROJECT No.	FIGURE No.	REV.
0257-042-06	17	0

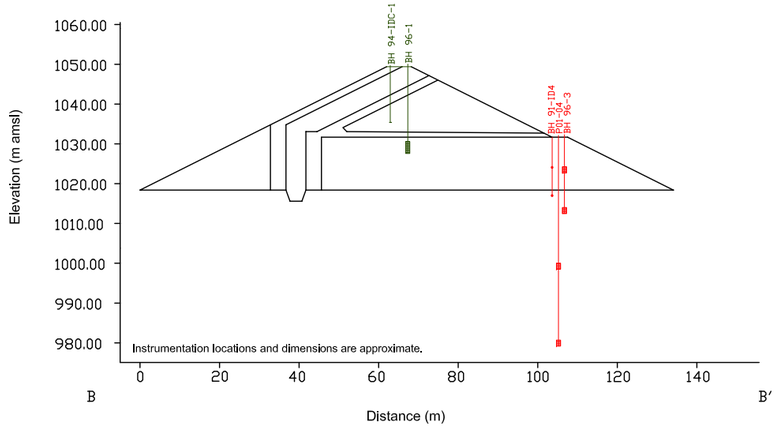
BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta
Phone: (403) 250-5185



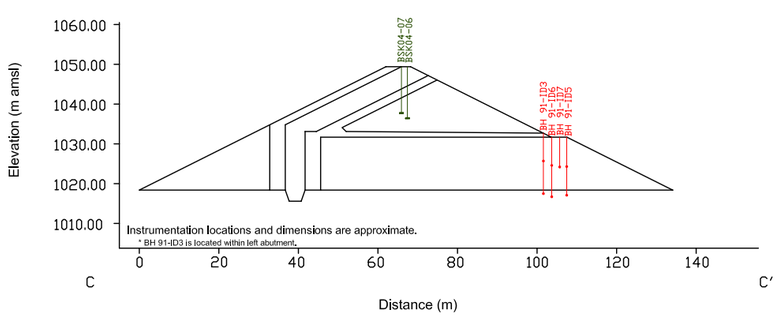
Intermediate Dam - Cross-Section A - A'



Intermediate Dam - Cross-Section B - B'



Intermediate Dam - Cross-Section C - C'



CLIENT:

Deloitte & Touche

- Screened Intervals of Standipe Piezometers
- Bottom of Standpipe Piezometers
- Pneumatic Piezometer Tips
- Crest Piezometers
- Downstream Toe Piezometers

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED

SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	JL
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT: 2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW

TITLE: SECTION VIEW OF INTERMEDIATE DAM

PROJECT No.	FIGURE No.	REV.
0257-042-06	18	0

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Calgary, AB Phone: (403) 250 5185

0257-042-06 Fig 17.dwg



June: shows a view of the crest. No real signs of cracking or deformation from this perspective.



June: shows the crest on the upstream side looking towards the north abutment. Again, the centreline crack has been relatively pervasive across the entire length of the crest. Vegetation on the upstream side is also getting large and should be removed.



June: shows the downstream toe looking towards the north abutment. No signs of seepage discharge or wet areas from this perspective. the amount of vegetation growing on the toe of the dam should be noted.



June: shows the downstream face looking towards the south abutment. No signs of seepage, deformation or sloughing are noted, however note the vegetation on the downstream face.

CLIENT:

Deloitte & Touche

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT
2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW

TITLE
CROSS VALLEY DAM INSPECTION PHOTOS

PROJECT No.	FIGURE No.	REV.
0257-042-06	19	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta
Phone: (403) 250-5185



September: shows the upstream side of the spillway at the Cross Valley Dam. The Cross Valley Pond is some 2 to 2.5 m below the inlet to the spillway. Note that the vegetation from the crest and upstream side of the dam has been removed. Also, spot repairs to the riprap have been undertaken.



September: shows the formation of strand lives on the soil within the reservoir.



September: shows the upstream side of the Cross Valley Dam. As can be seen, the pond is very low some 5 to 6 m below the physical crest of this dam. Note that the vegetation on the upstream side of the dam has been removed.

CLIENT:

Deloitte & Touche

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT: 2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW

TITLE: CROSS VALLEY DAM INSPECTION PHOTOS

PROJECT No.	FIGURE No.	REV.
0257-042-06	20	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta Phone: (403) 250-5185



September: shows the water running within the seepage collection ditch near the northern abutment.



June: shows the head pond being retained by the V-notched weir in the centre of the dam.



September: shows a number of boulders which appear to have congregated at the toe of the dam. Note that the vegetation has been removed from the toe of the dam.



September: shows the crest of the dam following removal of the vegetation in 2007.

CLIENT:

Deloitte & Touche

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

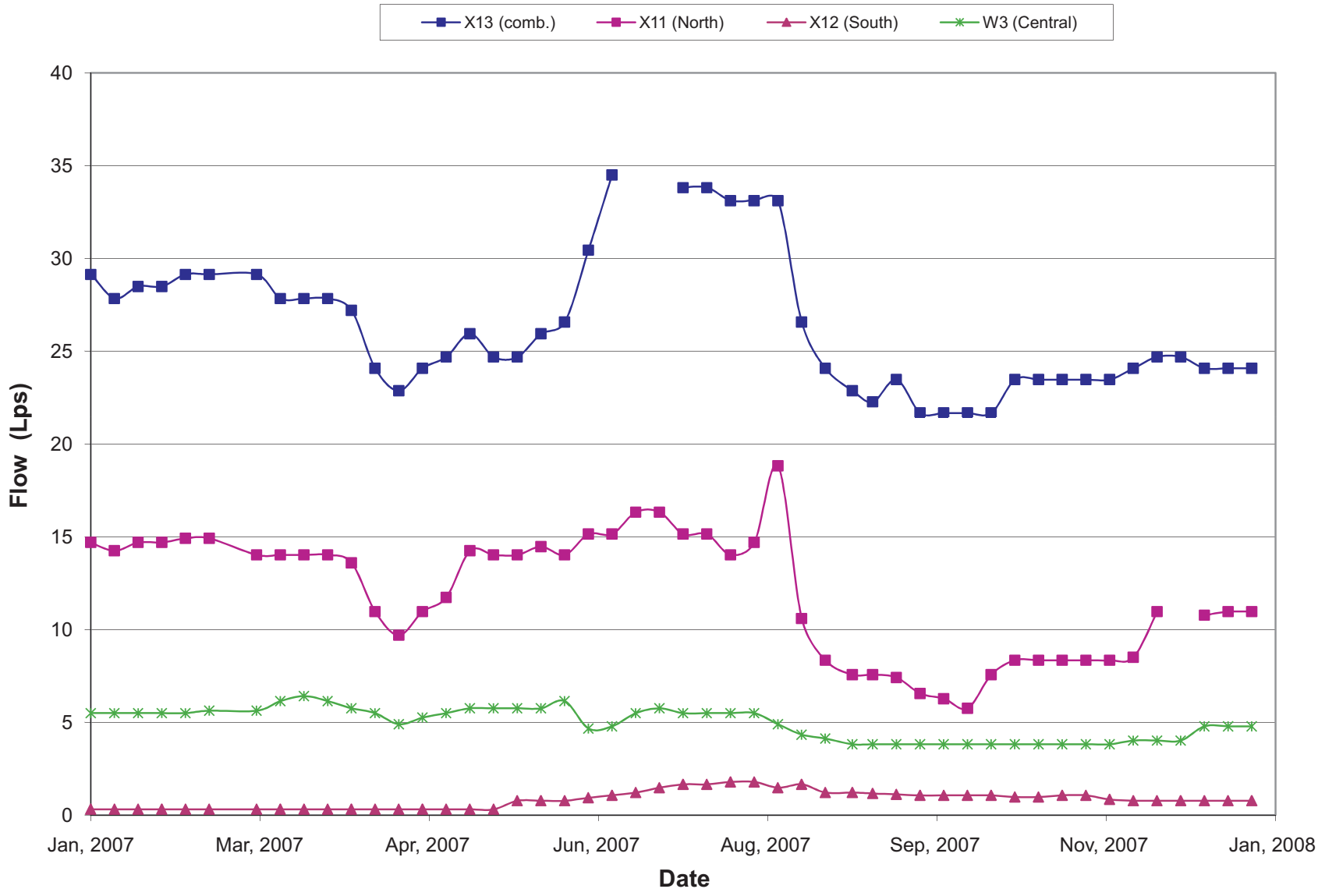
SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT: 2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW

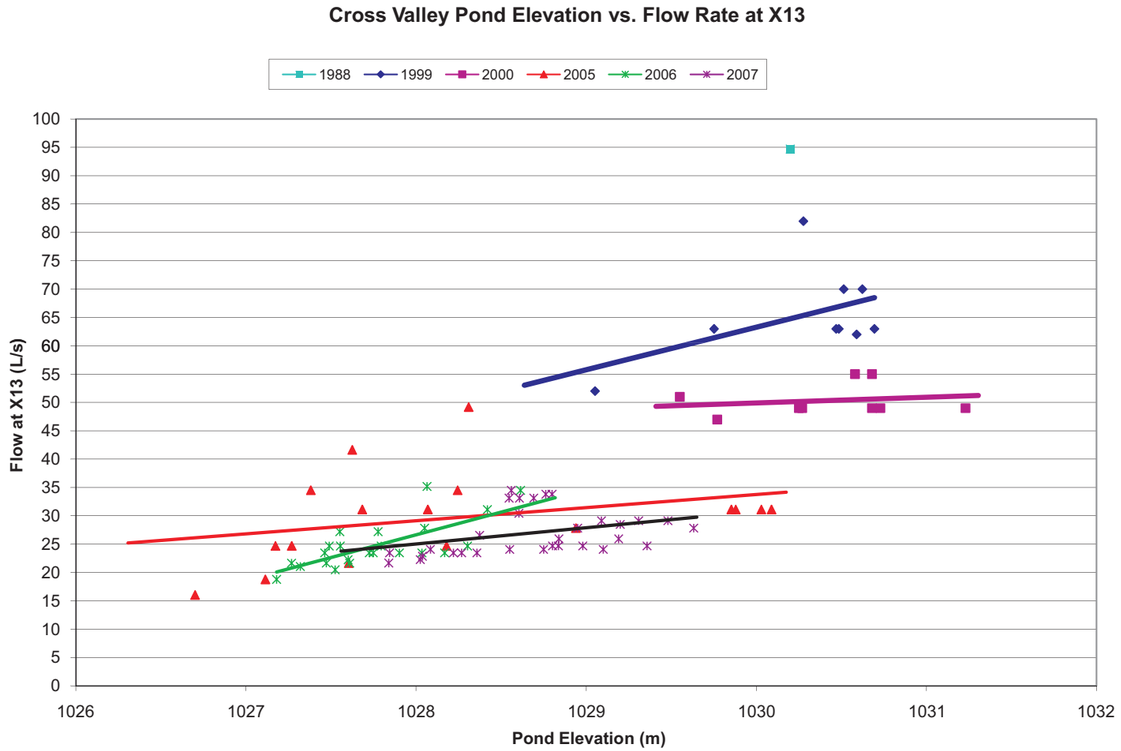
TITLE: CROSS VALLEY DAM INSPECTION PHOTOS

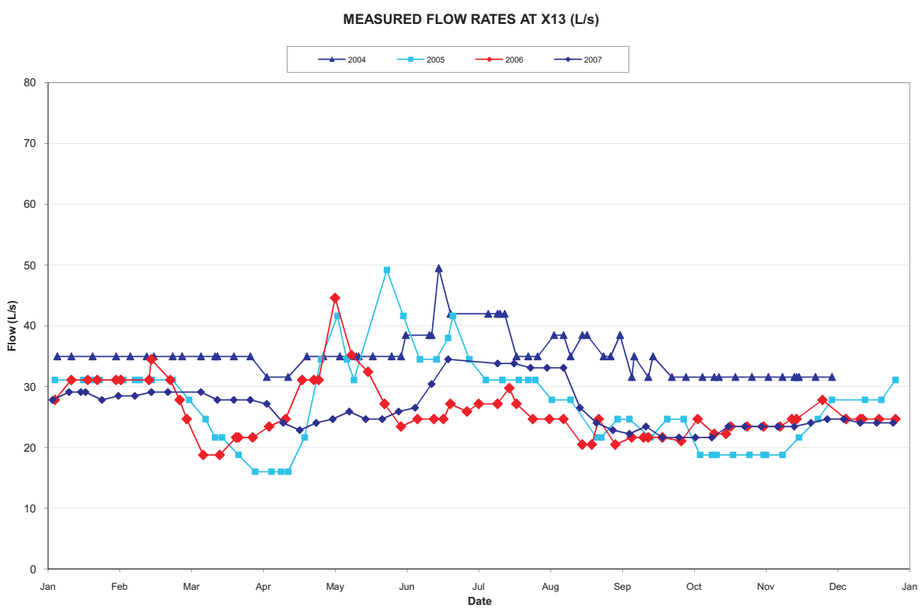
PROJECT No.	FIGURE No.	REV.
0257-042-06	21	0

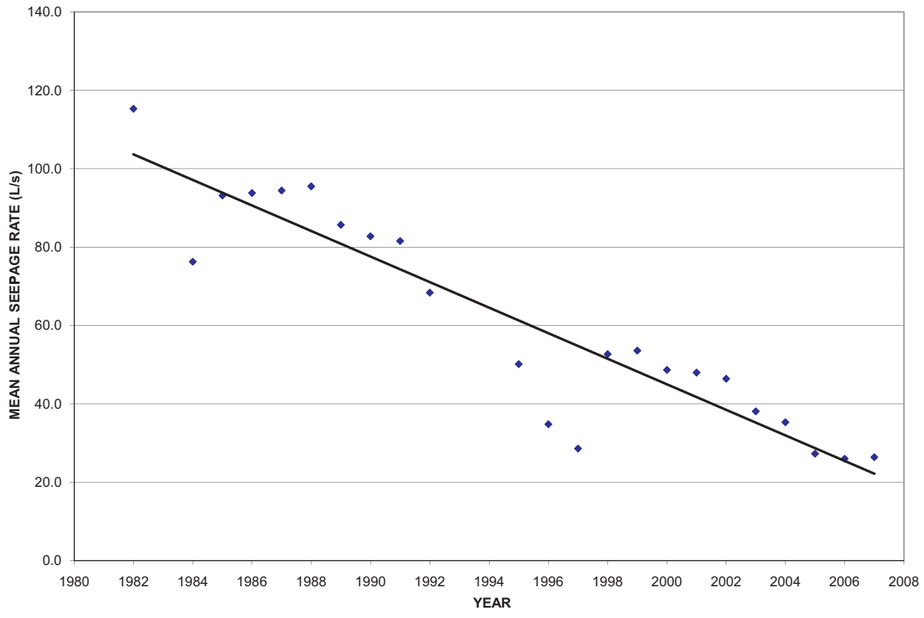
BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta Phone: (403) 250-5185



DATE: FEB 2008	DRAWN SLF	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY Calgary, Alberta Phone: (403) 250-5185	PROJECT 2007 ANNUAL GEOTECHNICAL EVALUATION & INSTRUMENTATION REVIEW		
REFERENCED DRAWING DESCRIPTION			TITLE CROSS VALLEY DAM 2007 WEIR FLOWS		
AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.		CLIENT Deloitte & Touche	PROJECT No. 0257-042-06	FIGURE No. 22	REV. 0







CLIENT:

Deloitte & Touche

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
.	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT

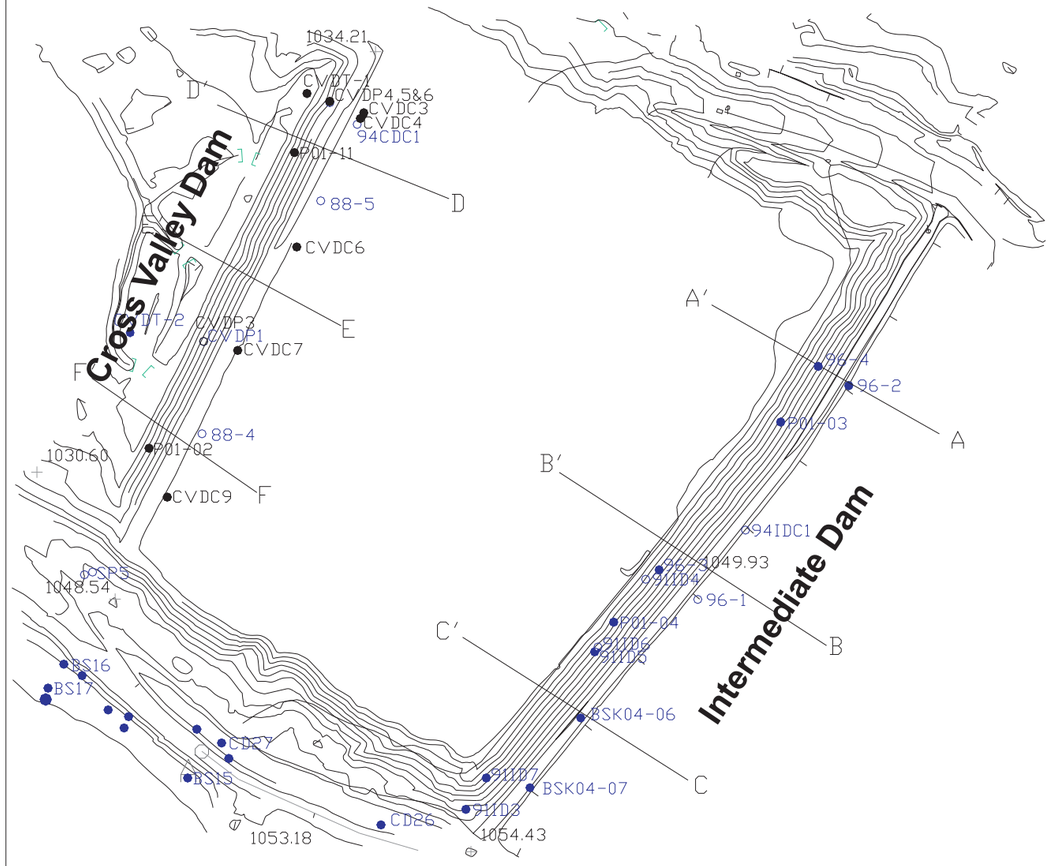
2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW

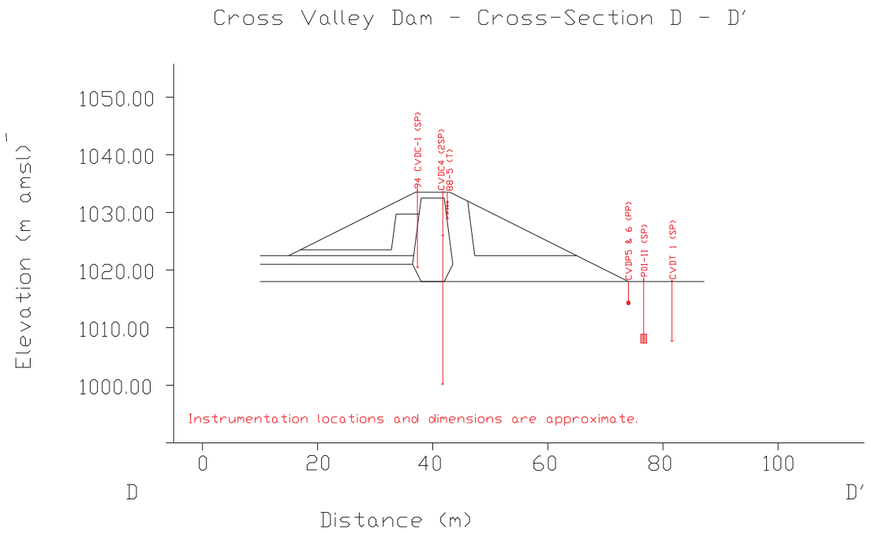
TITLE

CROSS VALLEY DAM MEASURED FLOW RATES AT X13

PROJECT No.	FIGURE No.	REV.
0257-042-06	23	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta
Phone: (403) 250-5185





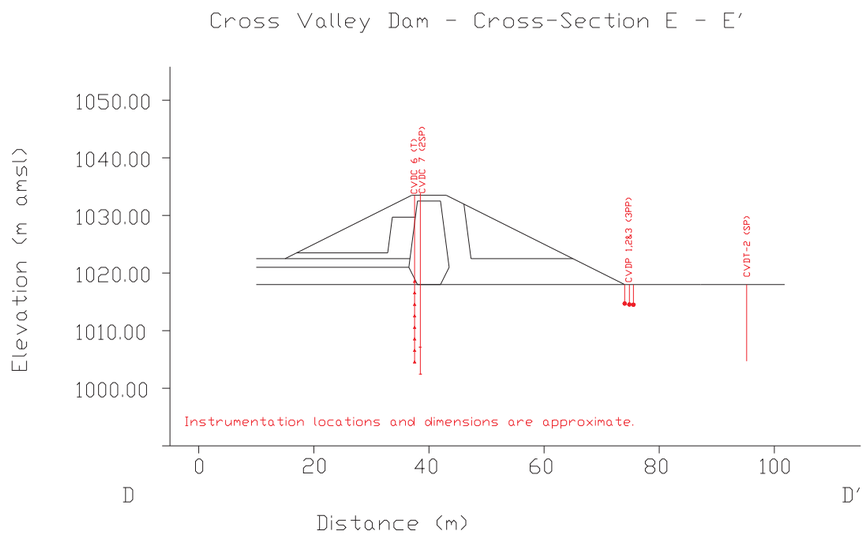
CLIENT:

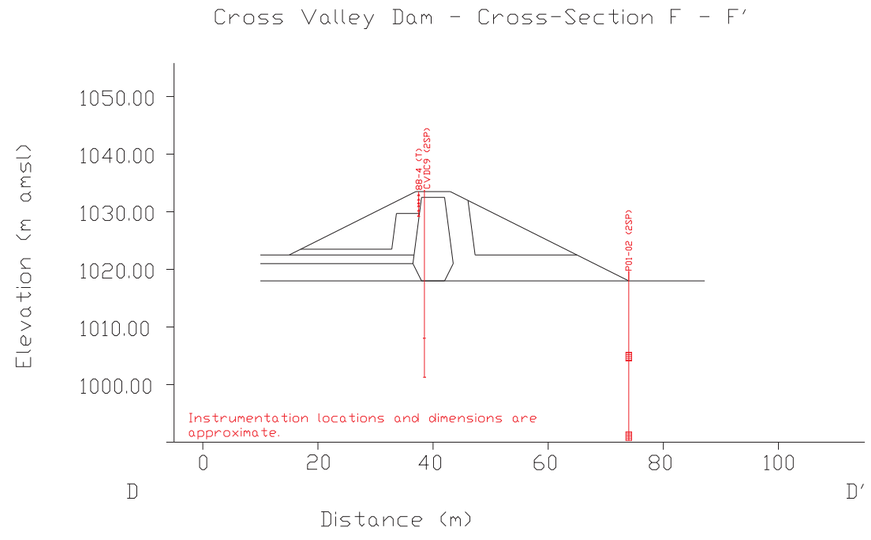
Deloitte & Touche

- SP Standpipe Piezometers
- PP Pneumatic Piezometers
- T Thermistor Cables
- Screened Intervals of Standipe Piezometers
- Bottom of Standpipe Piezometers
- Pneumatic Piezometer Tips
- Thermistor Nodes

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-





SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	JL
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT
2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW

TITLE
SECTION VIEW OF CROSS VALLEY DAM

PROJECT No.	FIGURE No.	REV.
0257-042-06	24	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta
Phone: (403) 250-5185



June: shows the Head Pond on the upstream side of the Rock Drain. The pond appears larger in area in extent than typical likely indicating a higher stream flow at the current time compared to previous inspections.



September: shows a panorama of the downstream side of the rock drain. As can be seen the majority of the face is covered with snow, although there are some patches at mid slope height which are free of snow likely results from warm air convections rising.

CLIENT:

Deloitte & Touche

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT: 2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW

TITLE: NORTH FORK ROCK DRAIN INSPECTION PHOTOS

PROJECT No.	FIGURE No.	REV.
0257-042-06	25	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta Phone: (403) 250-5185



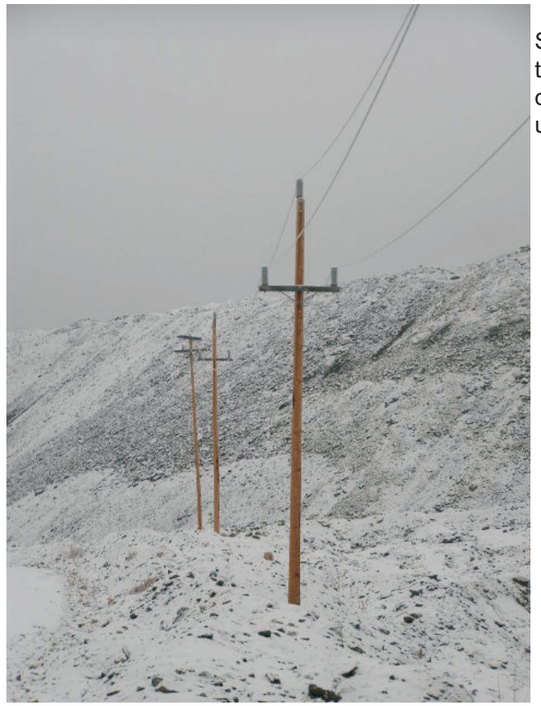
June: shows the water discharging from the toe of the Rock Drain. As can be seen, the water appears to be discharging quite well with some turbulent flow occurring.



June: shows a view along the downstream face of the Rock Drain showing no signs of distress.



June: is a view of the top of the Rock Drain looking to the east along the top of the causeway. From here to the power poles all appears to be pretty straight without signs of deformation.



September: shows a view of the three power poles located over the western portion of the upstream side of the rock drain.

CLIENT:

Deloitte & Touche

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

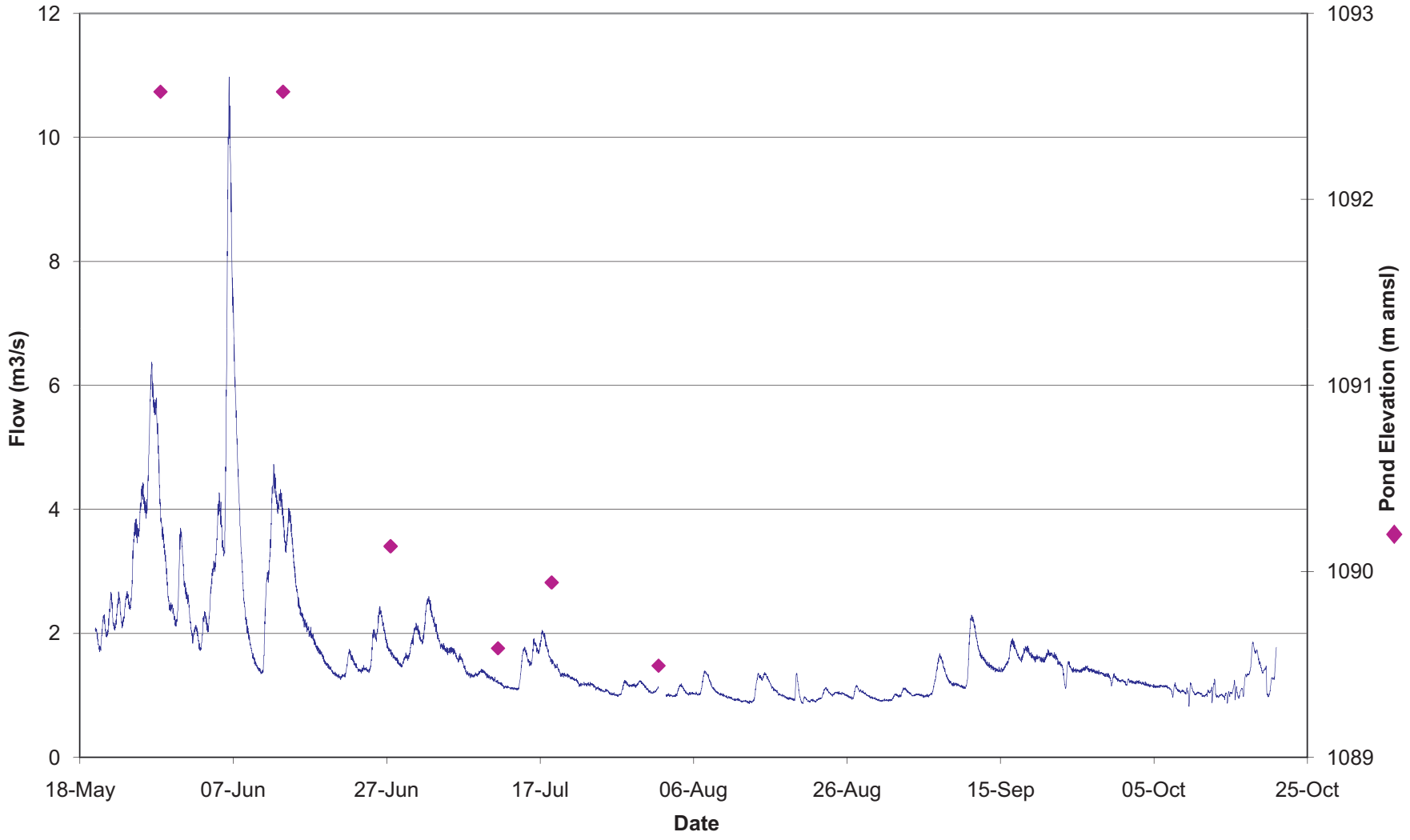
SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT: 2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW

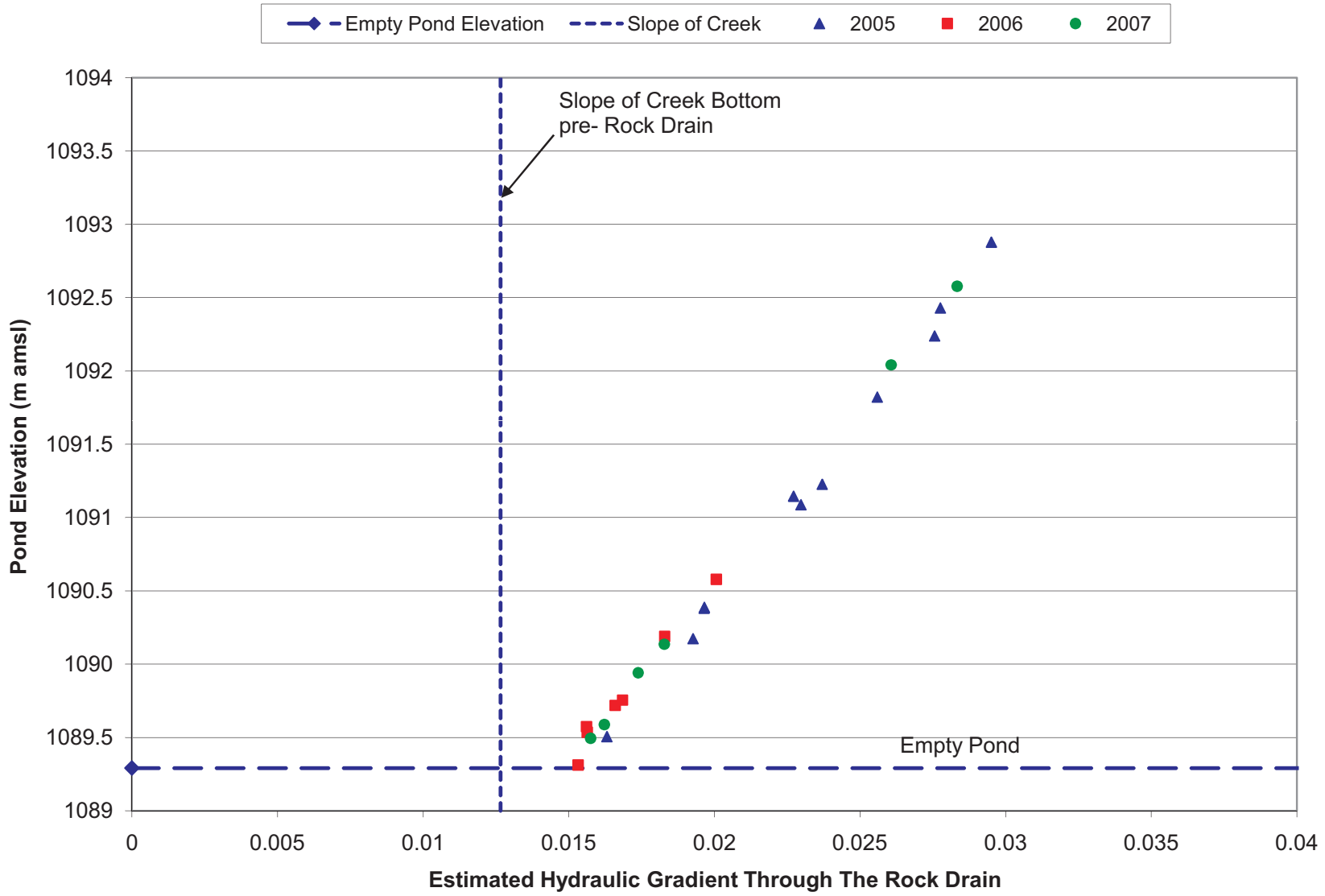
TITLE: NORTH FORK ROCK DRAIN INSPECTION PHOTOS

PROJECT No.	FIGURE No.	REV.
0257-042-06	26	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta Phone: (403) 250-5185



DATE: FEB 2008	DRAWN SLF	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY Calgary, Alberta Phone: (403) 250-5185	PROJECT 2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW
REFERENCED DRAWING DESCRIPTION			TITLE NORTH FORK ROCK DRAIN MEASURED POND ELEVATION AND CREEK DISCHARGE
AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.		CLIENT Deloitte & Touche	PROJECT No. 0257-042-06 / FIGURE No. 27 / REV. 0



DATE: FEB 2008	DRAWN SLF	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY Calgary, Alberta Phone: (403) 250-5185	PROJECT 2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW
REFERENCED DRAWING DESCRIPTION			TITLE NORTH FORK ROCK DRAIN FLOW THROUGH PERFORMANCE
AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.		CLIENT Deloitte & Touche	PROJECT No. 0257-042-06 / FIGURE No. 28 / REV. 0



June: shows the completed diversion works located over top of the seepage area. We have the ditch which has been excavated on the upstream side. This is complimented by the culvert which is complimented by a plastic pipe which is under the armour rock. This was completed in the area of the seepage event



June: shows the downstream end of the discharge culvert.



June: shows the armour rock which was placed on the downstream side of the toe in the area of the seepage event.



June: shows the canal condition in the north arm.

CLIENT:

Deloitte & Touche

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT: 2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW

TITLE: FARO CREEK DIVERSION CHANNEL INSPECTION PHOTOS

PROJECT No.	FIGURE No.	REV.
0257-042-06	29	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta
Phone: (403) 250-5185



June: just shows where some recent rock has been placed near the channel bottom. This provides a slight construction in the channel.



June: shows one of the new staff gauges installed in the Faro Creek Diversion Channel.

September: is a panoramic showing the discharge occurring at the toe seepage point #2. It occurs just below fill pad which is pushed out from the road fill.



CLIENT:

Deloitte & Touche

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

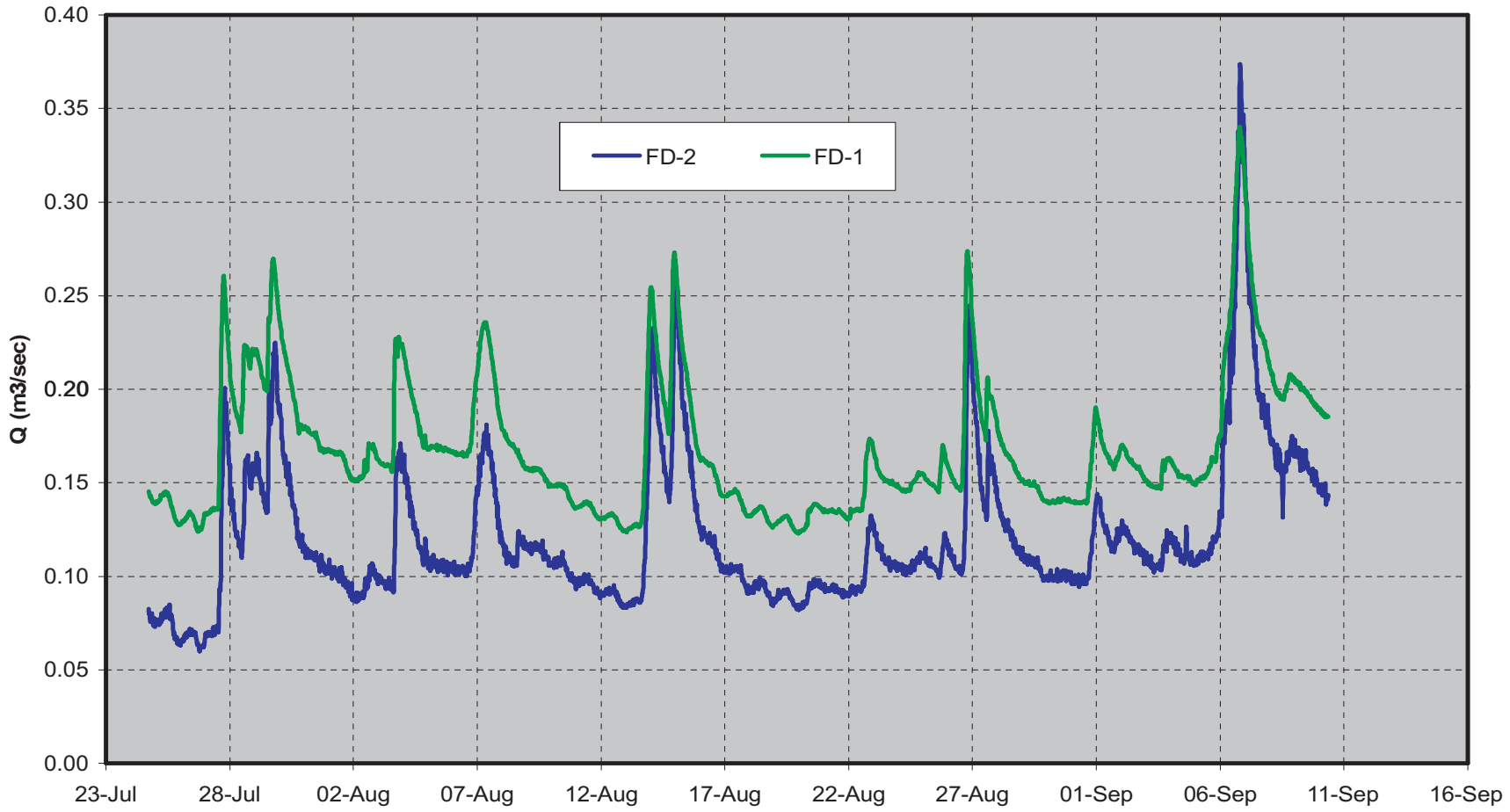
PROJECT
2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW

TITLE
FARO DIVERSION CHANNEL INSPECTION PHOTOS

PROJECT No.	FIGURE No.	REV.
0257-042-06	30	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta
Phone: (403) 250-5185

FD-1 (upstream) vs FD-2 (downstream) Preliminary Discharge



Source: Laberge Environment (See appendix V for full report)

DATE: FEB 2008	DRAWN SLF	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY Calgary, Alberta Phone: (403) 250-5185	PROJECT 2007 ANNUAL GEOTECHNICAL EVALUATION & INSTRUMENTATION REVIEW		
REFERENCED DRAWING DESCRIPTION			TITLE FARO CREEK DIVERSION CHANNEL 2007 FLOW RATES		
AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.		CLIENT Deloitte & Touche	PROJECT No. 0257-042-06	FIGURE No. 31	REV. 0



June: is a panoramic showing where the slough occurred in the uphill bank of the Diversion Canal. On the right hand side of the photo we have the oversteepend banks were cause by the runoff water. Down at the bottom we can see the riprap has been placed.

DATE: FEB 2008	DRAWN SLF	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY Calgary, Alberta Phone: (403) 250-5185	PROJECT 2007 ANNUAL GEOTECHNICAL EVALUATION & INSTRUMENTATION REVIEW
REFERENCED DRAWING DESCRIPTION			TITLE FARO CREEK DIVERSION CHANNEL INSPECTION PHOTO
AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.		CLIENT Deloitte & Touche	PROJECT No. 0257-042-06 / FIGURE No. 32 / REV. 0



June: a panoramic showing the Northeast dumps. The relatively smooth slopes and some seepage discharge are shown in this photo.

DATE: FEB 2008	DRAWN SLF	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY Calgary, Alberta Phone: (403) 250-5185	PROJECT 2007 ANNUAL GEOTECHNICAL EVALUATION & INSTRUMENTATION REVIEW
REFERENCED DRAWING DESCRIPTION			TITLE SELECTED WASTE ROCK DUMPS INSPECTION PHOTOS
AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.		CLIENT Deloitte & Touche	PROJECT No. 0257-042-06 / FIGURE No. 33 / REV. 0



June: shows the top to the Secondary Impoundment Dam looking towards the Diversion Dam.



June: a view of the crest of the east leg of the dam.



June: View of the crest, looking east.



June: the crest of the Secondary Dam as it meets the Primary Tailings Dam.

CLIENT:

Deloitte & Touche

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT: 2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW

TITLE: SECONDARY DAM INSPECTION PHOTOS

PROJECT No.	FIGURE No.	REV.
0257-042-06	34	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta
Phone: (403) 250-5185



June: shows a longitudinal crack and associated settlement trough located at the fill at the toe. This crack goes for some 50 m. But then jogs further to the left by the instrumentation in the background.



June: shows the crack as it continues around the corner.



June: shows the continuation of the road berm at the toe of this secondary impoundment.



September: shows a segment of the crest looking towards the east/southeast.

CLIENT:

Deloitte & Touche

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

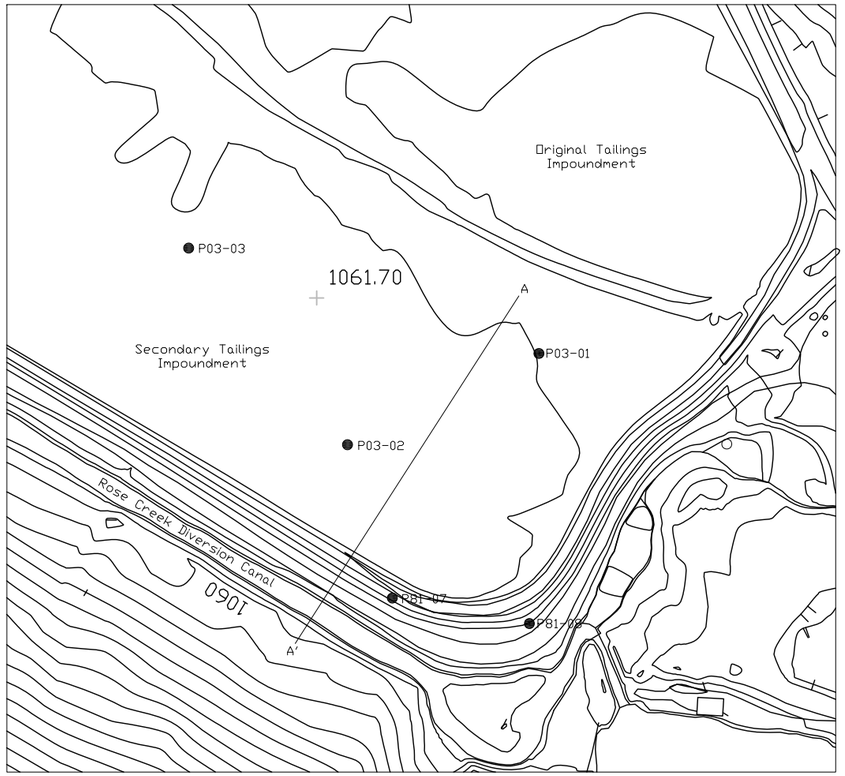
SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT
2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW

TITLE
SECONDARY DAM INSPECTION PHOTOS

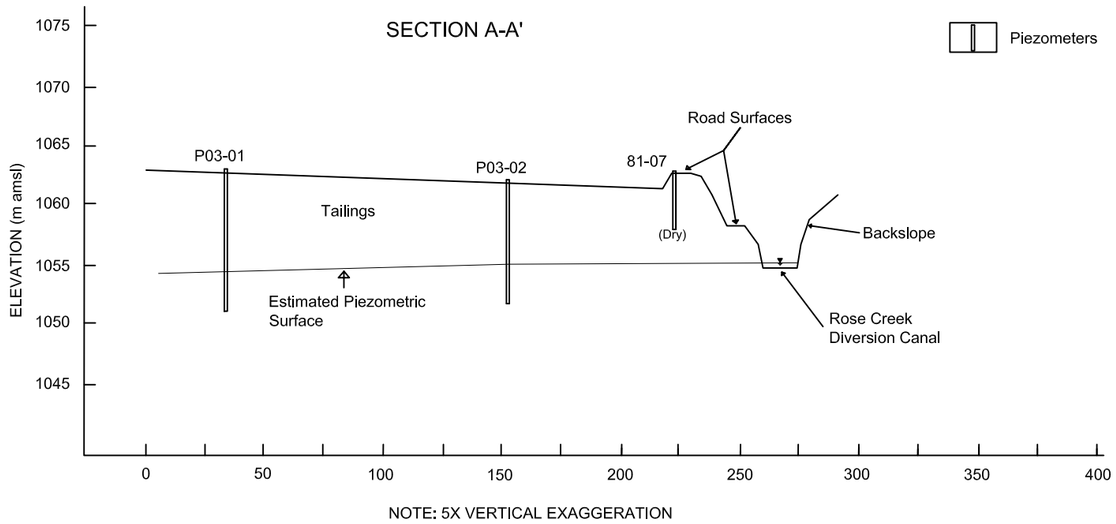
PROJECT No.	FIGURE No.	REV.
0257-042-06	35	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta
Phone: (403) 250-5185



NOTES: 1) DRAWING IS A SCHEMATIC, CONSTRUCTED FOR ILLUSTRATIVE PURPOSES ONLY.

2) ALL ELEVATIONS ARE APPROXIMATE.



NOTE: 5X VERTICAL EXAGGERATION

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECK	APPR.

SCALE: AS SHOWN
DATE: FEBRUARY 2008
DRAWN: JL
DESIGNED: BFA
CHECKED: GWF
APPROVED: JWC

PROFESSIONAL SEAL:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Deloitte & Touche

PROJECT: 2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENTATION REVIEW

TITLE: SECONDARY DAM CURRENT PIEZOMETRIC CONDITIONS

PROJECT No.: 0257-042-06
FIGURE No. 36
REV.: 0

K:\Projects\0257 D&T\042 2007 Faro Annual\06 Annual Geotech Inspection Report\Graphics\Drawings\0257-039-05 001 Fig 36.dwg Layout: Figure 36 Plot Date: Feb 21 08 Time: 9:15 AM

2008 INSTRUMENTATION READINGS SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	08	08	08	08	08	08	08	08	08	08	08	08
1. Diversion Canal												
THERMISTORS												
- Canal Dyke: CD-15, CD-21, BGC01-02, BGC05-04[5], BGC05-07[5]					***	***			***			
- Spoil Pile: SP-3, SP-5						***						
Backslope: BS-5, BS-9, BS-10, BS-12						***			***			
SLOPE INDICATORS					If blocked in May, attempt to read in June.							
- Canal Dike: CD-10, CD-15, CD-19, CD-21, BH94CD-1, BH91-CD1, BGC05-05, BGC05-08					***				***			
- Spoil Pile: SP-2, SP-5						***						
Backslope: BS-5, BS-9, BS-10						***						
PIEZOMETERS												
- Canal Dyke: CD-13, CD-15, CD-21 BGC05-02, BGC05-03, BGC05-06					***	***			***			
Backslope: BS-5, BS-9						***			***			
STAFF GAUGE: RCDC-4, New Staff Gauges[6]				daily	daily	daily	daily	daily	daily			
2. Cross Valley Dam												
THERMISTORS - CVDC-6, BH88-4					***	***			***			
PIEZOMETERS: CVDC-4, CVDC-7, CVDC-9, CVDT-1, CVDT-2, CVDP-1, CVDP-3, CVDP-5, CVDP-6, 94 CVDC-1, P01-11[2]					***	***			***			
WEIR FLOWS[1]: X-11, **X-12**, **W3**[3]	***	***	***	***	***	***	***	***	***	***	***	***
WEIR FLOWS[1]: X-13	weekly	weekly	weekly	weekly	weekly	weekly	weekly	weekly	weekly	weekly	weekly	weekly
POLISHING POND WATER LEVEL	weekly	weekly	weekly	weekly	weekly	weekly	weekly	weekly	weekly	weekly	weekly	weekly
3. Intermediate Dam												
PIEZOMETERS: 91ID-4, 91-ID-6, 91-ID-7, 94-IDC-1, 96-1, 96-2, 96-3, 96-4, P01-03[2], P01-04[2], BKS04-06, BKS04-07					***	***			***			
91-ID3 (with seepage observations near south abutment)					***	***		***	***			
RETAINED POND WATER LEVEL	weekly	weekly	weekly	weekly	weekly	weekly	weekly	weekly	weekly	weekly	weekly	weekly
4. Secondary Tailings Dam												
PIEZOMETERS: P81-6, P81-7, P81-8; P03-01[4], P03-02[4], P03-03[4]					***	***			***			
5. North Fork Rock Drain												
DATALOGGERS (automatic): can be removed in 2008												
STAFF GAUGES[1]**:** NFRD23 and X2				daily	daily	daily	weekly	weekly	weekly	weekly		
Survey or Staff Gauge: Pond, Toe of drain					weekly	weekly	weekly	weekly	weekly			
6. Faro Creek Diversion Channel												
STAFF GAUGES: FCD-1, FCD-2, FCD-1A[7]**, FCD-1B**[7]				bi-weekly	bi-weekly	bi-weekly	bi-weekly	bi-weekly	bi-weekly	bi-weekly		

NOTES:

1 Confirm accuracy of monitoring techniques.
2 Before monitoring P01 series monitoring wells, confirm with GLL staff in Whitehorse that it is alright to do so.
3 Monitor Instrumentation twice per month
4 Monitored as part of Environmental Monitoring Program, provide elevation data to BGC
5 These instruments need a different switch box for thermistor to read. Will be provided in early 2008
6 Scheduled for installation in 2008, need to develop rating curves for new instuments.
7 Need to establish rating curve for these staff gauges.

CLIENT:

Deloitte & Touche

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA STATEMENTS CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

SCALE:	N/A
DATE:	FEBRUARY 2008
DRAWN:	SLF
DESIGNED:	BFA
CHECKED:	GWF
APPROVED:	JWC

PROJECT: 2007 ANNUAL GEOTECHNICAL EVALUATION AND INSTRUMENT REVIEW

TITLE: 2008 MONITORING SCHEDULE

PROJECT No.	FIGURE No.	REV.
0257-042-06	37	0

BGC Engineering Inc.
AN APPLIED EARTH SCIENCES COMPANY
Calgary Alberta Phone: (403) 250-5185

APPENDIX I
FARO CREEK SEEPAGE EVENT

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
1605, 840 - 7 Avenue SW
Calgary, Alberta T2P 3G2
Tel.: (403) 250-5185
Fax: (403) 250-5330

October 30, 2007
Proposal No. 0257-045-05

Mr. Doug Sedgwick
Deloitte & Touche
Suite 1900, TD Centre
79 Wellington Street West
Toronto, ON
M5K 1B9

Dear Mr. Sedgwick:

RE: STATUS OF FARO CREEK DIVERSION CHANNEL
FARO MINE, YT

BGC Engineering Inc. (BGC) has been involved with the assessment and repair of the Faro Creek Diversion Channel (FCDC) since May 2007, following a seepage event which occurred in the east-west leg of the channel. A series of memoranda have been issued to describe the seepage event, and the related follow-up assessment work that has been used to gain further understanding of the event and develop recommendations for future actions. These memoranda are as follows:

- Summary of Seepage Event and Remediation Efforts, Faro Creek Diversion Channel, May 23, 2007.
- Supplementary Memo on Channel Rehabilitation Needs, Faro Creek Diversion Channel, June 28, 2008.
- Summary of Notes and Recommendations, FMEA Risk Assessment, Faro Creek Diversion Channel, July 27, 2007.

The physical repairs recommended in the June memorandum were undertaken in early September and reported in a draft memorandum dated September 17, 2007 entitled “Remediation Construction Summary, Faro Creek Diversion”.

The July memorandum indicated that the site was subject to eight moderately-high risks, which are summarized in the following Table 1. In addition, some comments on the status of each recommendation are provided as well.

Table 1 Status of Summary Recommendations

Recommendations	Status / Commentary
#1 Accelerate final design of relocated FCDC by fall 2008, including survey, hydrology, geotechnical and permits.	Snow arrived early (Sept 24th) at the elevation of the FCDC, which prevents proper survey from taking place in 2007. Survey work should be delegated for as soon as practical in 2008, followed by award of design work. Action by Deloitte to award work.
#2 Review conceptual drainage and seepage reductions options/costs for east wall instability, including liner, drains and freezing by fall 2007.	Some channel quantity measurements have been recorded by LaBerge. Conceptual levels options and costs could likely be undertaken. Action by Deloitte to award work.
#3 Review contingency measures for potential pit failure (pit levels, varying flow amounts, potential for pipeline in forest, etc.) and potential site management of the consequences.	Some contingency planning done at various levels of details and located within various documents and reports. Need to undertaken comprehensive contingency planning, involving site staff, to ensure potential consequences can be handled. Action by Deloitte to award work.
#4 Potential of enhanced instrumentation program (e.g. deep slope indicator) at east wall failure to provide additional monitoring data on overall wall stability.	Golder Associates are providing services related to pit wall stability and they provide yearly opinions on the wall stability. Following from their 2007 assessment, Golder should provide commentary on the benefits and costs for enhanced program. Deloitte to contact Golder to initiate.
#5 Site reconnaissance and fix problem oversteepened slopes.	Snow arrived early (Sept 24th) at the elevation of the FCDC, which prevented any assessment by BGC at that time. Following spring thaw in 2008, field engineer should inspect the overburden slopes and provide direction to site staff on resloping to be done. Action by Deloitte to award work for 2008.
#6 Formal hydraulic capacity assessment of FCDC.	Snow arrived early (Sept 24th) at the elevation of the FCDC, which prevents proper survey from taking place in 2007. Survey work should be delegated for as soon as practical in 2008, followed by award of assessment work. Action by Deloitte to award work.
#7 Install more staff gauges in FCDC by August.	Two more gauges were installed in August. Laberge should download the associated dataloggers (if access is safe) and forward information to BGC for interpretation within the 2007 Annual Geotechnical Report. Action by Laberge (with direction by BGC).
#8 Place stockpile (500 m^3) of riprap plus 5 rolls geotextile at Faro Valley dump	Unsure of status – need to confirm with Dana Haggar or other site staff if done.

In summary, the very early snow of Sept. 24th effectively put an end to potential plans to do additional work this fall. As such, a number of the work studies will need to be put off until 2008 due to practical reasons. But, as noted in Table 1, appropriate scopes of work need to be developed and work awards initiated by Deloitte so that some of the work could be initiated in the near future.

Previously, in early 2007, two staff gauges were installed in the FCDC, one near the start of the diversion, FC-1, and one upstream of the transition to the bedrock section, FC-2. In August, Laberge Environmental personnel were on-site installing two additional staff gauges within the channel. Staff gauge FC-1A was installed downstream of the upper rip rap section and staff gauge FC-1B was installed upstream of the downstream rip rap segment. Flow measurements from September 2007 are shown in Table 2.

Table 2 FCDC Flow Quantity Measurements

Station	September 4, 2007		September 6, 2007**	
	Flow (m^3/s)	Flow Loss as compared to FC-1 (%)	Flow (m^3/s)	Flow Loss as compared to FC-1 (%)
FC-1	0.155		0.277	
FC-1A			0.250	10
FC-1B			0.241	13
FC-2	0.120	29	0.235	15

**Note: Flow measurements for Sept. 6th may have been affected by the construction activities that were ongoing

Measurements of flow at these two staff gauges indicated between 20 and 30% of the flow is lost to water discharge from the channel. Losses appear roughly equal on the three noted sections defined by the gauge locations.

During the construction activities in early September (as reported in the BGC September memorandum), the subgrade material under the road dike consisted of soft and saturated organic soils. Beneath the channel section, fractured bedrock was encountered and seepage of about 10 to 20 litres per minute was encountered. The construction and investigation activities confirmed that the subsurface conditions beneath the dike and channel are variable and sometimes poor in terms of engineering properties. The existence of these conditions confirms that the channel and dike were “informally constructed” without detailed engineering design or construction monitoring. In essence, variable and undefined native ground conditions remain under the dike and the channel, with all attendant risks and consequences of failure for those materials.

To supplement these observations, Mr. Dana Haggar has proposed to undertake a program of test pits to potentially investigate the extent of the poor quality subsurface conditions. BGC concurs with this opinion and all testpits should be properly logged and located to document the conditions so encountered. Unfortunately, this work will also be practically postponed until 2008 due to access restrictions and frozen ground considerations.

We hope that the information supplied herein is sufficient for your present purposes. Please contact the undersigned should you have any questions or comments.

Respectfully submitted,
BGC ENGINEERING INC.

per:



Gerry Ferris, M.Sc., P.Eng.
Senior Geotechnical Engineer

Reviewed by:



James W. Cassie, M.Sc., P.Eng.
Specialist Geotechnical Engineer

Deloitte.

Deloitte & Touche LLP
79 Wellington Street West
Suite 1900
P.O. Box 29 TD Centre
Toronto ON M5K 1B9
Canada

Tel: 416-601-6510
Fax: 416-601-6400
www.deloitte.ca

Memo

Date: December 6, 2007

To: Dana Haggar, Gerry Ferris

From: Doug Sedgwick

Subject: Recommendations by BGC relating to Faro Creek Diversion issues

A letter report dated October 30, 2007 was prepared by BGC following the repairs carried out on the Faro Creek Diversion in September 2007. The report included a summary of recommended actions that should be taken relating to the Faro Creek Diversion beyond the repairs carried out in September. The recommended actions were the result of the Risk Assessment workshop conducted at BGC in late July 2007.

As a result of discussions with Gerry Ferris at BGC and Dana Haggar, the following are the intended actions that have been/will be taken relating to the recommendations.

1. Accelerate final design of relocated FCDC by fall 2008, including survey, hydrology, geotechnical and permits – An email was sent to Valerie Chort, Wes Treleaven, John Brodie and Stephen Mead on November 1, 2007 along with the October 30, 2007 letter report. The email noted the work carried out by Golder and their report dated February 5, 2004 (on file) relating to the alternative relocations of the Faro Creek Diversion including initial design, field survey and approximate costs. The email stated that the recommendation should be kept in mind when considering the 2008/2009 planned projects.

2. Review conceptual drainage and seepage reductions options/costs for east wall instability, including liner, drains and freezing by fall 2007 – Several channel quantity measurements were recorded by Laberge. Further work will be carried out during the 2008 summer season as part of the Care and Maintenance budget (estimated costs approximately $10,000).

3. Review contingency measures for potential pit failure (pit levels, varying flow amounts, potential for pipeline in forest, etc. and potential site management of the consequences – This work has been carried out previously and is one of the elements in the Emergency Response Plan.

4. Potential of enhanced instrumentation program (e.g., deep slope indicator) at east wall failure to provide additional monitoring data on overall wall stability – Golder along with Site staff assistance have an ongoing formal monitoring program in place.

5. Site reconnaissance and fix problem oversteepened slopes – BGC will work with Site management during the summer of 2008 on resloping work. (minimal costs anticipated).

6. Formal Hydraulic Capacity Assessment of FCDC – It was decided following discussion with BGC that based on measurements to date, there is significant overcapacity in the diversion channel to carry a major flood event and that to expend $20,000 to $30,000 on this assessment was not necessary at this time.

7. Install more staff gauges in FCDC by August 2007 – Two additional gauges were installed in August and a monitoring program established.

8. Place stockpile (500m2) of riprap plus 5 rolls geotextile at Faro Valley Dump – This work has been carried out by site management.

In addition to the above, Dana Haggar recommended with BGC's concurrence , that a test pit program be carried out during the summer of 2008 to investigate the extent of the poor quality subsurface conditions along the upper portion of the diversion channel. The minimal costs are included in the Care and Maintenance budget.

Please contact me if you have any questions concerning the above recommendations and actions taken.

Doug Sedgwick

C: John Brodie, Valerie Chort, Wes Treleaven

APPENDIX II
SITE VISIT INSPECTION MEMOS
(JUNE AND SEPTEMBER)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
1605, 840 – 7 Avenue S.W., Calgary, Alberta, Canada. T2P 3G2
Phone (403) 250-5185 Fax (403) 250-5330

PROJECT MEMORANDUM

To:	**Anvil Range Mining / Deloitte &Touche**	**Fax No.:**	**By email**
Attention:	**Dana Haggar / Doug Sedgwick**	**CC:**	**By email**
From:	**Jim Cassie, P.Eng.**	**Date:**	**June 21, 2007**
Subject:	**June Site Inspection Conditions Selected Facilities, Faro Mine, YT**		
No. of Pages (including this page): 3 Pages		**Project No:**	**0257-042-02 0257-043-01**

Mr. Jim Cassie, P.Eng., from BGC Engineering Inc.(BGC), undertook a visual inspection of selected facilities at Faro Mine on June 13 and 14, 2007. During this inspection the items contained in this memo were discussed on site with Mr. Dana Haggar, Mine Manager. This memo summarizes the conditions observed, along with any required maintenance or monitoring:

FWSD Breach Project

- Slough at the south abutment appears to be pseudo-stable from the sloughed material; no significant seepage noted.
- Channel flow is passing around the edges of selected riffles. Evidence of backwater pooling in areas proximal to riffles. Very minor erosion noted on channel section.
- Some minor erosional noted on channel sections close to the tributary confluence.
- Minor erosional gullies located along the edge of the seepage control blanket.
- No concerns or maintenance required.

K8 Creek Rehab.

- Possible small slump of the rip rap of the left side (looking downstream) of the channel.
- Otherwise, channel appears in satisfactory condition.

Cross Valley Dam

- Centre of crest crack evident on the dam again; monitor but will probably close up as thaw progresses.
- Crest vegetation to be removed.
- Appears in satisfactory condition.

This communication is intended for the use of the above named recipient. Any unauthorized use, copying, review or disclosure of the contents by other than the recipient is prohibited.

Intermediate Dam

- No crest cracking or toe seepage noted.
- Crest vegetation to be removed.
- Downstream face displays only minor rilling erosion.
- Approximately 11 small (1 to 5 m diameter) surficial slough features noted at the toe of the downstream face. Visually monitor to ensure they do not increase in extent.
- Appears in satisfactory condition.

Secondary Impoundment Dam

- No visual concerns were noted on the dam crest.
- Crack and associated settlement trough within toe berm/access road should be graded over.

Rose Creek Diversion Channel (backslope and canal dike crest).

- No new sloughs noted on the backslope.
- No signs of cracking or settlement noted on the canal dike crest.
- Channel appears in satisfactory condition.

North Fork Rose Creek Rock Drain

- Rock drain appears to be discharging water with no signs of instability.
- Continue with monitoring program provided by Gerry Ferris.

North Valley Wall Interceptor Ditch – Outfall Section (near CV Dam)

- Channel and culvert were inspected and found to be flowing properly.
- Appears in satisfactory condition.

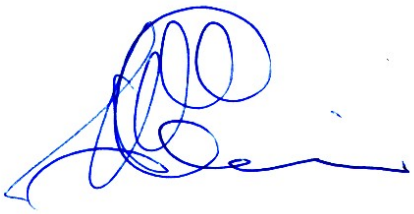
Faro Creek Diversion Channel

- Recent slough displaced some overburden material into the channel. Reslope oversteeped slope near slough and armour to prevent further erosion.
- Toe seepage occurring at May seepage location. Two test pits excavated for investigation. Geotextile and armour rock placed on the downstream slope of the canal dike. Refer to separate memo on the FCDC seepage rehabilitation (under separate cover).
- Noted two new staff gauges installed in creek by Laberge Environmental Services last month. These gauges should be read every two weeks or so.
- Channel appears to be performing in a satisfactory manner.

This communication is intended for the use of the above named recipient. Any unauthorized use, copying, review or disclosure of the contents by other than the recipient is prohibited.

In general, the inspected facilities appear in satisfactory condition and only some minor maintenance and monitoring is required. Please contact the undersigned should you have any questions or comments.

Respectfully submitted,
BGC Engineering Inc.
per:



James W. Cassie, M.Sc., P.Eng.
Specialist Geotechnical Engineer

This communication is intended for the use of the above named recipient. Any unauthorized use, copying, review or disclosure of the contents by other than the recipient is prohibited.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
1605, 840 – 7 Avenue S.W. , Calgary, Alberta, Canada. T2P 3G2
Phone (403) 250-5185 Fax (403) 250-5330

PROJECT MEMORANDUM

To:	**Anvil Range Mining Corp.**	**Fax No.:**	**By email**
Attention:	**Glen Craig / Dana Haggar**	**CC:**	**Gerry Ferris**
From:	**Jim Cassie**	**Date:**	**September 26, 2007**
Subject:	**Summary of Site Conditions on Selected Structures Fall Visit, Faro Mine, YT**		
No. of Pages (including this page): 2		**Project No:**	**0257-042**

Mr. Jim Cassie, P.Eng. from BGC Engineering Inc. (BGC) undertook the fall geotechnical inspection site visit from September 24 to 26, 2007. Snowfall occurred at the site during the period which covered over some of the surface features. Following is a brief summary off the conditions, concerns and maintenance for the inspected facilities:

FWS Dam Breach

- Some riffles are “disturbed” but no significant concerns.
- Slough at south abutment appears “stable”.
- Some 5 to 6 erosional gullies have formed on the north cut-slope (down the breach channel) on the upstream side of the dam. These gullies should either be flattened to prevent further erosion or erosional protection rockfill placed.
- No other concerns noted.

K8 Creek Rehabilitation

- No concerns noted.

Intermediate Dam

- Grade the small ridge (0.3 to 0.5 m high) formed by the rip rap on the upstream edge of the crest; ensure a smooth crest edge.
- No other concerns noted.

This communication is intended for the use of the above named recipient. Any unauthorized use, copying, review or disclosure of the contents by other than the recipient is prohibited.

Cross Valley Dam

- No concerns noted.

Secondary Impoundment Dam

- No concerns noted.

Rose Creek Diversion Canal

- Some 25 seepage points observed at the toe of the Canal Dike, in the area of previously noted seepage.
- No concerns noted with dike crest, backslope or the weir sections.

Faro Creek Diversion Channel

- A total of 5 seepage points were noted at the dike toe below the FCDC. All seepage points were running clear. BGC will forward the GPS waypoints under separate cover. Monitoring should continue over the winter in terms of quantity and clear nature of these seeps.
- A small buttress of geotextile/rockfill should be placed at the toe of Seepage Point #4 (taped off area that sloughed in May 2007). This will provide some protection in case the seepage velocity increases next spring.
- No others concerns noted, but almost 20 cm of snow cover in the area.

North Fork Rock Drain

- No concerns noted.

This communication is intended for the use of the above named recipient. Any unauthorized use, copying, review or disclosure of the contents by other than the recipient is prohibited.

APPENDIX III
INTERMEDIATE DAM RIP RAP REPAIRS

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
200, 1121 Centre Street NW, Calgary, Alberta, Canada. T2E 7K6
Phone (403) 250-5185 Fax (403) 250-5330

MEMORANDUM

To:	**Deloitte & Touche Inc.**	**Fax No.:**	**Via e-mail**
Attention:	**Doug Sedgwick**	**CC:**	**Dana Haggar**
From:	**Gerry Ferris**	**Date:**	**February 19, 2008**
Subject:	**Intermediate Dam Rip Rap Repairs**		
No. of Pages (including this page): 14		**Project No:**	**0257-046-01**

1.0 INTRODUCTION

The Intermediate Dam at the Faro Mine, Faro, Yukon is evaluated regularly by site staff and periodically by Geotechnical Engineers as part of the annual inspection of the mine site. This geotechnical review includes a visual assessment of the rip rap on the upstream face of the dam, see Photos 1 and 2. The performance of the rip rap has been acceptable since at least 2000, the date BGC started performing the assessment. During a late summer 2006 site visit[1] numerous locations were noted on the upstream face of the Intermediate Dam where the rip rap was no longer continuous, which exposed the underlying dam shell material, Photos 3 through 5.

The exposure of the dam shell material, within zones formerly covered by rip rap, was thought to be the result of both wave erosion and ice plucking[1]. The wave erosion was occurring in the dam shell material, when the water level was being maintained below the base of the rip rap. Small scarps were formed by the wave action, which then lead to small scale sliding of the rip rap downslope into the eroded area. Ice plucking, could occur in the spring when the ice cover was still on the pond and the reservoir was drawn down. Both of these are related to the drawdown of water levels in the Intermediate Dam pond, which has been occurring regularly in the spring over the past few years, as shown in Figure 1. The as-built report[2] for the 1991 dam raise indicates that the base of the rip rap was installed at 1046.7 m amsl. As shown in Figure 1 the water level of the pond has been routinely maintained below this elevation for extended periods of time. Of note, the water was maintained below this elevation for water treatment reasons (personnel communication with site manager).

[1] BGC Engineering Inc. 2007 2006 Annual Geotechnical Evaluation and Instrument Review, Various Facilities at Faro Mine, Yukon. Report No. 0257-039-05, prepared for Deloitte & Touche Inc.
[2] Golder Associates 1992 Down Valley Tailings Area, 1991 Construction Projects, Faro, Yukon. Report No. 912-2406, prepared for Curragh Resources Inc.

It was recommended in the 2006 Annual report[1] that the rip rap at the Intermediate Dam be repaired. A program was initiated, by Deloitte & Touche Inc. in 2007 to complete the recommended repairs.

In May 2007, BGC submitted a proposal outlining the steps needed to complete the rip rap repairs which included the following tasks:

1. Review Background Information,
2. Check the rip rap specifications and preparation of conceptual repair options, and
3. Complete the construction.

The proposed program was accepted and the work performed during 2007. This memo summarizes the work completed.

2.0 BACKGROUND INFORMATION

The Intermediate Dam was designed to allow for multiple dam raises throughout the planned tailings deposition[3]. The last dam raise completed was in 1991[2]. As part of the 1991 dam raise rip rap was placed on the face of the dam, between elevations 1046.7 and 1048.7 m amsl. This rip rap consisted of 0.3 m thickness of Class III amour rock. The Class III amour rock was placed directly on the general sand and gravel fill making up the upstream shell of the dam.

Class III amour rock has the following characteristics “a well graded blend of particles with a grain size greater than 75 mm in diameter and less than 300 mm in diameter”[4]. The upstream dam shell material was well graded sand and gravel with less than 30 percent by weight passing the 80 micron Standard sieve size and a maximum size of 75 mm[4].

3.0 RIP RAP SPECIFICATIONS

No design information could be found, in the records available to the author, to validate the choice of the gradation used for the Class III material in 1991. However, it is expected that the rip rap sizing was selected based on stopping wave erosion of the upstream face of the dam, and not for ice plucking. This is expected since the rip rap sizes typically required to protect against ice plucking range from 0.44 m diameter to 1 m diameter. Additionally, large fluctuations in the tailings pond elevation were not expected. Therefore, a check of the rip rap design (considering wave action) for the current care and maintenance operation was undertaken as part of this study.

[3] Golder Associates 1980 Final Design Recommendations for the Down Valley Tailings Disposal Project, Faro, Yukon. Report No. 792-2025, prepared for Cyprus Anvil Mining.
[4] Golder Associates 1991 Intermediate Dam 1991 Raising and Cross Valley Dam Toe Drain, Tender Documents, General Clauses and Detailed Specifications, Faro, Yukon. Report 912-2402, Prepared for Curragh Resources Inc.

To evaluate the required size of rip rap for the Intermediate Dam it was necessary to consider wave action resulting from wind. Previously Northwest Hydraulic Consultants Ltd. (NHC) performed a detailed analysis of the wind speeds and directions for the Fresh Water Supply Dam[5]. Due to the orientation of this reservoir being the same as the Fresh Water Supply Reservoir, the data compiled by NHC was used in this analysis. The maximum fetch distance over both reservoirs is from the southeast. NHC evaluated the wind speed coming from the southeast for the years 1980 to 2002. The data evaluated was from Environment Canada's weather station at the Faro Airport, about 20 km away. The highest wind speed (hourly two-minute average) recorded in that time period was 39 km/hr. The highest wind speed was used as the design storm acting on the design water level.

Maximum wave height expected for the Intermediate Pond was read off Figure 13.2[6] based on the above noted wind speed and a fetch distance of 400 m. The maximum wave height is 0.2 m (the design wave height). The sizing of rip rap needed based on the design wave height can be calculated by the following equation[6], as outlined by the US Corps of Engineers Shore Protection Manual.

$$W_{50} = \frac{\gamma_r H^3}{K_{RR}(S_r - 1)^3 \cot\Theta}$$

with W_{50} weight in kilonewtons of the 50 percent size in the rip rap.
γ_r unit weight of the rip rap rock substance in kN/m^3 = 2600 kN/m^3.
H design wave height in metres = 0.2 m.
S_r specific gravity of the rip rap rock water relative to the water in the dam ($S_r = \gamma_r/\gamma_w$) = 2.6.
cotΘ upstream slope =2.0 (horizontal / vertical).
K_{RR} stability coefficient = 2.5 for angular quarried rock and non breaking waves.

A wave height of 0.2 m requires a rip rap mass of 1.0 kg for the 50 percent size. The maximum mass of graded rip rap (W_{100}) is $4W_{50}$ and the minimum $0.125W_{50}$. Therefore the maximum size of rip rap is 4.0 kg and the minimum is 0.1 kg. When this is converted to sizes, based on round rock, the required rock size is 40 to 110 mm. This is less than the size of the Class III amour rock that was placed on the surface of the dam in 1991.

Rip rap from the Grum Quarry was developed in 2006 and suitable gradation rip rap can be obtained from that material.

[5] Northwest Hydraulic Consultants 2002 Final proposal for stakeholder review, Design brief, Hydraulic design, South fork Rose Creek, Faro Mine, Lowering of Fresh Water Supply Dam spillway. Report 6235/4167, prepared for BGC Engineering Inc.

[6] Fell, R., MacGregor, P. and Stapledon, D. 1992 Geotechnical Engineering of Embankment Dams. Balkema, Rotterdam

4.0 CONSTRUCTION

On the 1991 as-built drawing[4] it was noted that there was another, lower level of rip rap on the face of the dam, between elevation 1043.2 and 1045.2 m amsl. Initial recommendations were to place rip rap on the face of the dam between the upper and lower amour zones. However, prior to construction, site staff examined the face of the dam (with low water levels and through the use of a small 'fishing' under water camera) and did not encounter the lower rip rap zone. Following this, the repairs were modified to include repairs to the existing rip rap surface, and covering the face of the dam, to the maximum extent of the excavator reach.

Construction of the rip rap repairs were completed by site personnel during August 2007. BGC representatives were not present for the repair work; the repairs were conducted under the supervision of the Faro Mine site staff. A selection of photographs taken during construction are shown in Photos 6 though 8. Various views of the completed project are shown in Photos 9 though 12. Based on these photographs and personnel communications with site staff, the resulting rip rap on the face of the dam meets the required minimum sizes indicated in Section 3. Thus, if the pond level at the Intermediate Dam is maintained at elevations protected by rip rap, and if the winter pond elevations are maintained relatively constant, the repaired rip rap should perform adequately.

Following completion of the work, the rip rap was reviewed as part of the 2007 Faro Annual Inspection and was considered to be adequate.

5.0 CLOSURE

This report summarizes the rip rap repairs completed at the Intermediate Dam during 2007. Thank you for the opportunity to be of service to Deloitte and Faro Mine. Should you have any questions on this report, please contact BGC at your convenience.

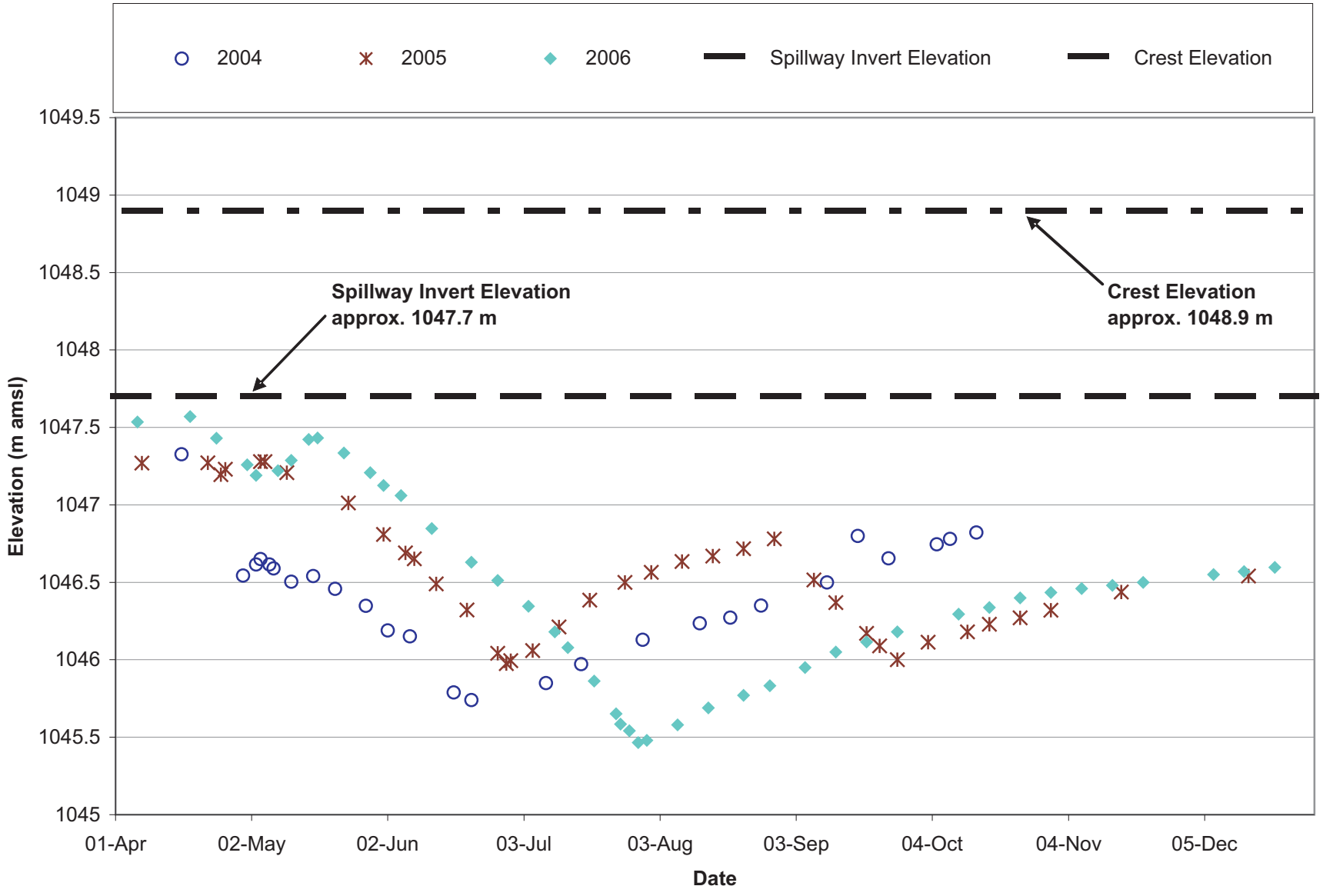
Respectfully submitted,
BGC Engineering Inc.
per:

Gerry Ferris, M.Sc., P.Eng.
Geotechnical Engineer
Reviewed by:

Ashton Friesen, EIT
Mining Engineer

Holger Hartmaier, M.Eng., P.Eng. (AB)
Senior Geotechnical Engineer

FIGURES



DATE: FEB 2008	DRAWN SLF	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY Calgary, Alberta Phone: (403) 250-5185	PROJECT	INTERMEDIATE DAM RIPRAP REPAIRS	
REFERENCED DRAWING DESCRIPTION			TITLE	INTERMEDIATE DAM POND ELEVATIONS (2004-2006)	
AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.		CLIENT Deloitte & Touche	PROJECT No. 0257-046-01	FIGURE No. 1	REV. 0

APPENDIX I
PHOTOS



Photo 1 - June 2002 - shows a view of the rip rap at the Intermediate Dam. The rip rap consists largely of cobble and boulder sizes.



Photo 2 - September 2002 - low water levels in the fall of 2002 and the rip rap remaining in relatively good repair.

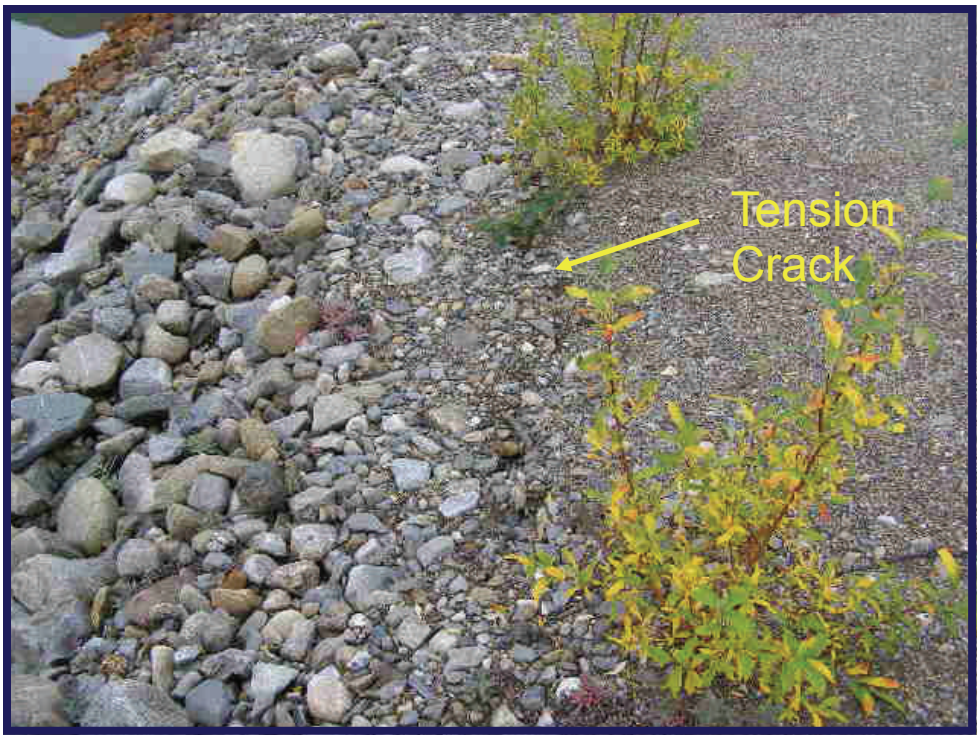


Photo 3 - August 2006 - shows a small tension crack forming at the crest of the intermediate dam as the rip rap below has slid.



Photo 4 - August 2006 - movement of the rip rap has exposed the underlying shell material.



Photo 5 - September 2006 - movement of the rip rap has exposed the underlying shell material



Photo 6 - August 2007 - Repairs are underway at the Intermediate dam rip rap.



Photo 7 - August 2007 - Repairs are underway at the Intermediate dam rip rap



Photo 8 - August 2007 - Repairs are underway at the Intermediate dam rip rap.



Photo 9 - August 2007 - Completed work at the Intermediate Dam rip rap.



Photo 10 - August 2007 - Completed work at the Intermediate Dam rip rap.



Photo 11 - August 2007 - Completed work at the Intermediate Dam rip rap.



Photo 12 - September 2007 - Completed work at the Intermediate Dam rip rap.

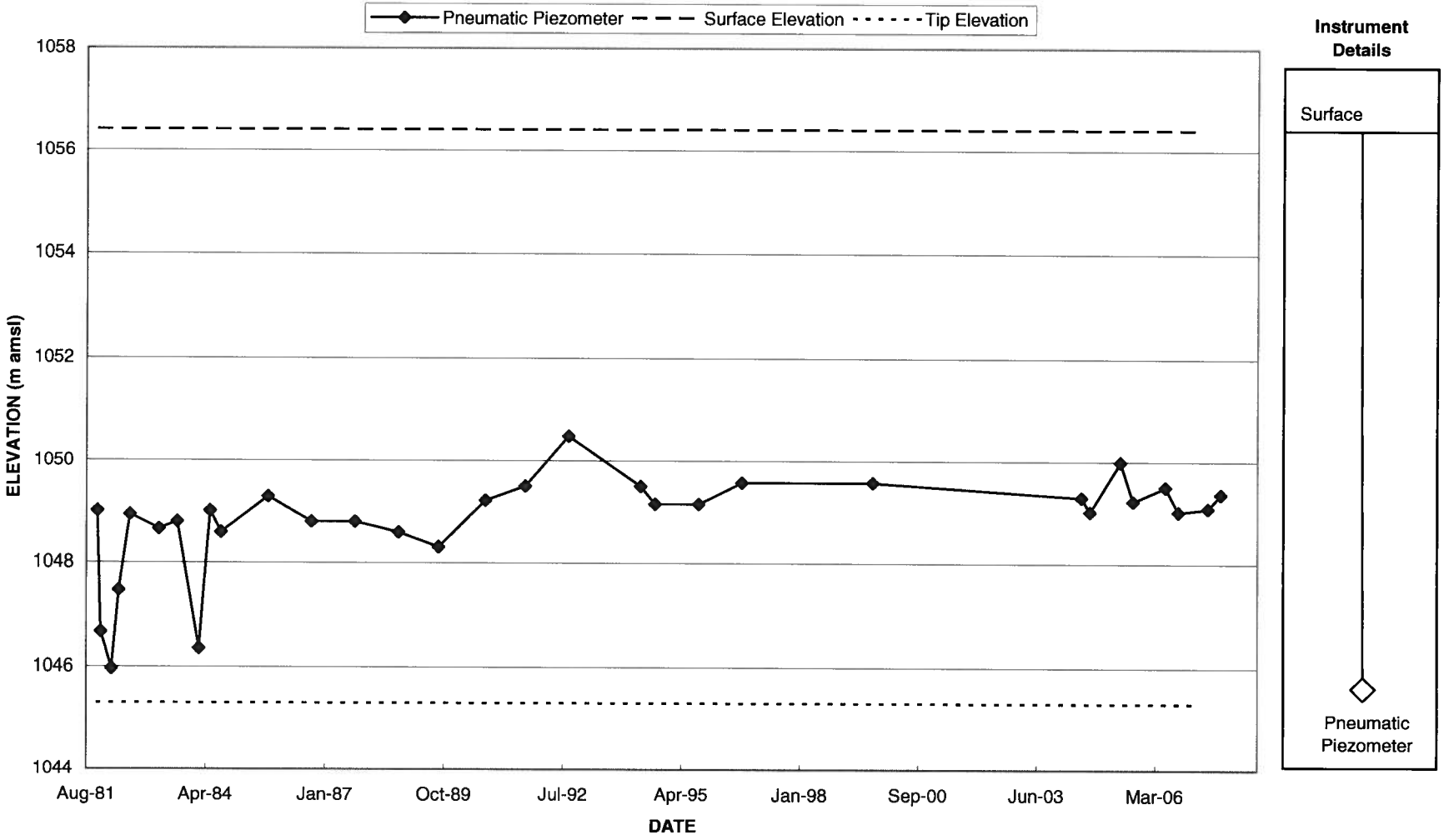
APPENDIX IV
INSTRUMENTATION DATA RECORDS AND GRAPHS

Faro Mine Instrumentation - Diversion Canal Dike

CD-10		Location:	Canal Dike St.0+990	Date Installed:	1981
		Coordinates:	1008.7N, 1519.7E	Ground Elevation (m amsl):	1056.41
Surface Protector:	Yes		8V581739 6913053	Tip Elevation (m amsl):	1045.30

Date		Reading (psi)		Piezometric Elevation (m amsl)	Comments
Nov-81		5.3		1049.01	
Dec-81		1.95		1046.67	
Mar-82		0.95		1045.97	
May-82		3.1		1047.47	
Aug-82		5.2		1048.94	
Apr-83		4.8		1048.66	
Sep-83		5		1048.80	
Mar-84		1.5		1046.35	
Jun-84		5.3		1049.01	
Sep-84		4.7		1048.59	
Oct-85		5.7		1049.29	
Oct-86		5		1048.80	
Oct-87		5		1048.80	
Oct-88		4.7		1048.59	
Sep-89		4.3		1048.31	
Oct-90		5.6		1049.22	
Sep-91		6		1049.50	
Sep-92		7.4		1050.48	
May-94		6		1049.50	
Sep-94		5.5		1049.15	
Sep-95		5.5		1049.15	
Sep-96		6.1		1049.57	
11-Sep-99		6.1		1049.57	
6-Jul-04		5.7		1049.29	
16-Sep-04		5.3		1049.01	
31-May-05		6.7		1049.99	
14-Sep-05		5.6		1049.22	
14-Jun-06		6		1049.50	
2-Oct-06		5.3		1049.01	
6-Jun-07		5.4		1049.08	
24-Sep-07		5.8		1049.36	

DIVERSIONAL CANAL DIKE
Piezometric Monitoring
CD-10 Pneumatic Piezometer



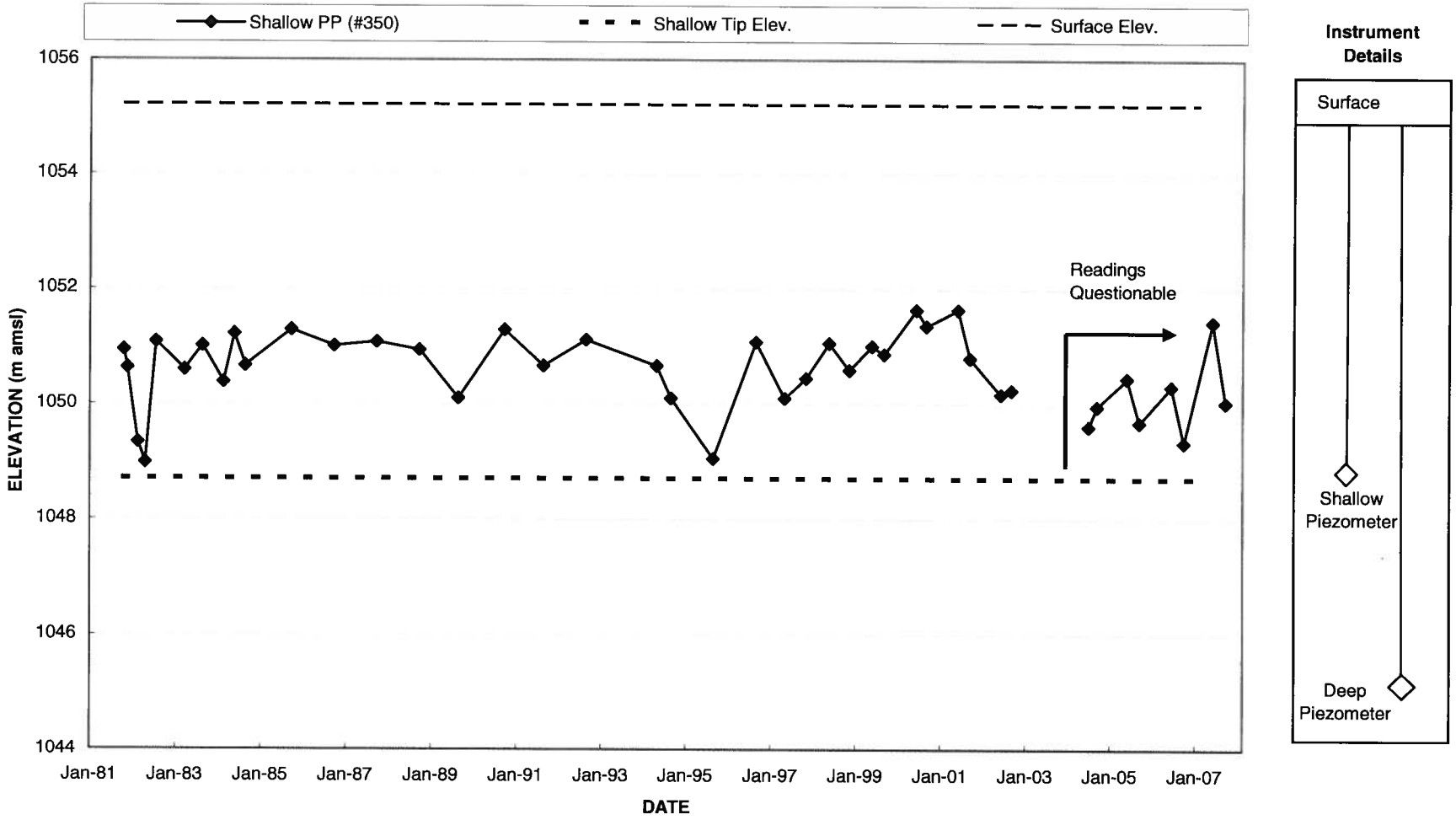
Faro Mine Instrumentation - Diversion Canal Dike

CD-13		Location:	Canal Dike St.1+350	Ground Elevation (m amsl):	1055.214
		Coordinates:	8V581400 6913185	Shallow Tip Elevation (m amsl):	1048.70
Surface Protector:	yes	Date Installed:	1981	Deep Tip Elevation (m amsl):	1044.70

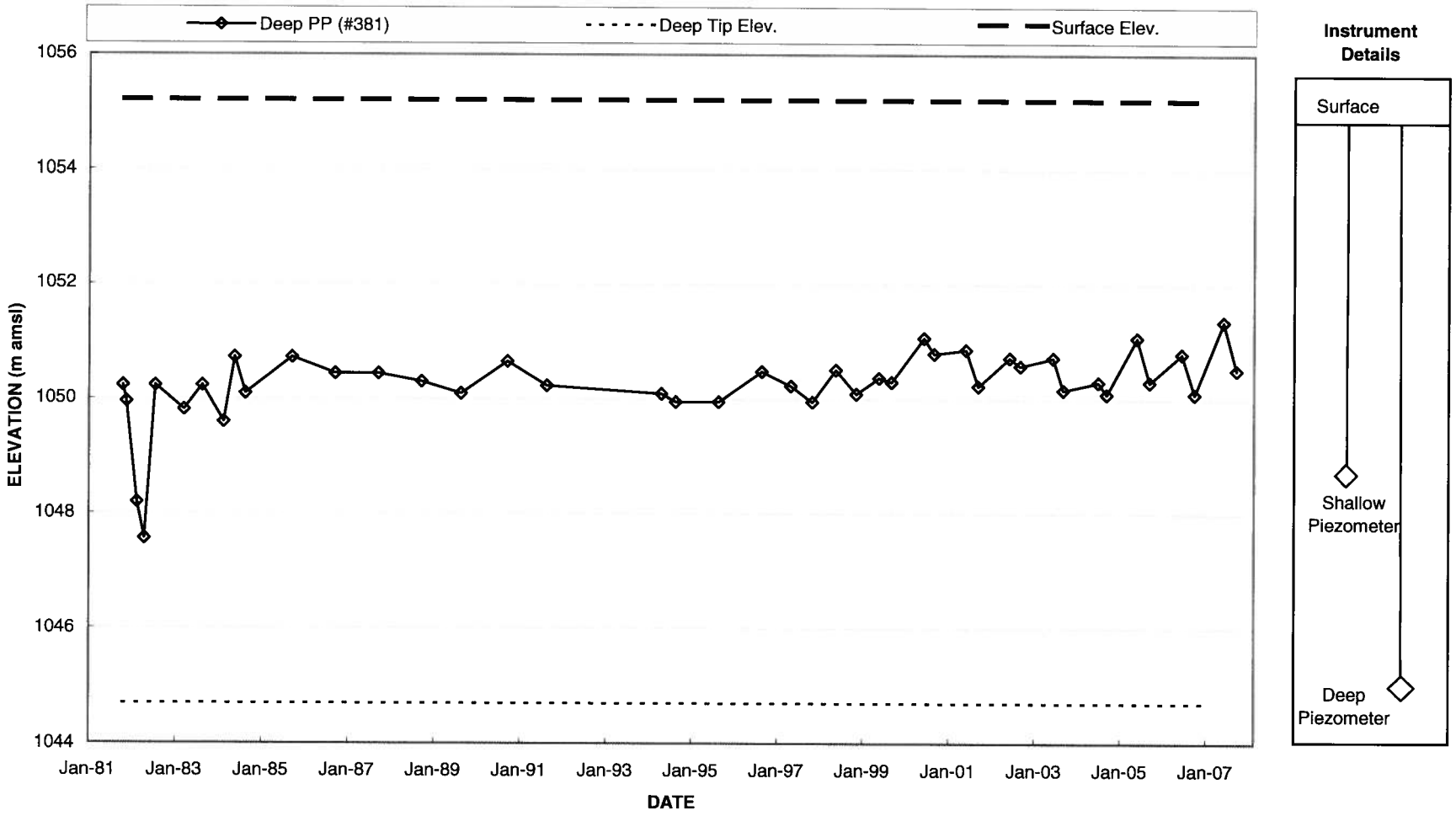
	Reading (psi)		Piezometric Elevation (m amsl)		
	Shallow PP	Deep PP	Shallow	Deep	
Date	(#350)	(#381)	(#350)	(#381)	Comments
Nov-81	3.2	7.9	1050.94	1050.23	
Dec-81	2.75	7.5	1050.63	1049.95	
Mar-82	0.9	5	1049.33	1048.20	
May-82	0.4	4.1	1048.98	1047.57	
Aug-82	3.4	7.9	1051.08	1050.23	
Apr-83	2.7	7.3	1050.59	1049.81	
Sep-83	3.3	7.9	1051.01	1050.23	
Mar-84	2.4	7	1050.38	1049.60	
Jun-84	3.6	8.6	1051.22	1050.72	
Sep-84	2.8	7.7	1050.66	1050.09	
Oct-85	3.7	8.6	1051.29	1050.72	
Oct-86	3.3	8.2	1051.01	1050.44	
Oct-87	3.4	8.2	1051.08	1050.44	
Oct-88	3.2	8	1050.94	1050.30	
Sep-89	2	7.7	1050.10	1050.09	
Oct-90	3.7	8.5	1051.29	1050.65	
Sep-91	2.8	7.9	1050.66	1050.23	
Sep-92	3.45		1051.12		
May-94	2.8	7.7	1050.66	1050.09	
Sep-94	2	7.5	1050.10	1049.95	
Sep-95	0.5	7.5	1049.05	1049.95	
Sep-96	3.4	8.25	1051.08	1050.48	
08-May-97	2.0	7.9	1050.10	1050.23	
07-Nov-97	2.5	7.5	1050.45	1049.95	
26-May-98	3.37	8.30	1051.06	1050.51	
15-Nov-98	2.70	7.70	1050.59	1050.09	
28-May-99	3.30	8.10	1051.01	1050.37	
11-Sep-99	3.10	8.00	1050.87	1050.30	
14-Jun-00	4.20	9.10	1051.64	1051.07	
09-Sep-00	3.80	8.70	1051.36	1050.79	
06-Jun-01	4.20	8.80	1051.64	1050.86	
19-Sep-01	3.00	7.90	1050.80	1050.23	
13-Jun-02	2.1	8.6	1050.17	1050.72	
12-Sep-02	2.2	8.4	1050.24	1050.58	
17-Jun-03	0.1	8.6		1050.72	(#350 very wet)
12-Sep-03	0.1	7.8		1050.16	(#350 very wet)
06-Jul-04	1.3	8	1049.61	1050.30	(#350 kept rising)
16-Sep-04	1.8	7.7	1049.96	1050.09	(#350 kept rising)
31-May-05	2.5	9.1	1050.45	1051.07	(#350 kept rising)
14-Sep-05	1.4	8	1049.68	1050.30	#350 Bubbles stop then numbers start rising
14-Jun-06	2.3	8.7	1050.31	1050.79	#350 Keeps Climbing
2-Oct-06	0.9	7.7	1049.33	1050.09	Ice in casing and on cable
06-Jun-07	3.9	9.5	1051.43	1051.35	read three times, was very noisy
24-Sep-07	1.9	8.3	1050.03	1050.51	#350 stopped then keeps rising

Questionable values

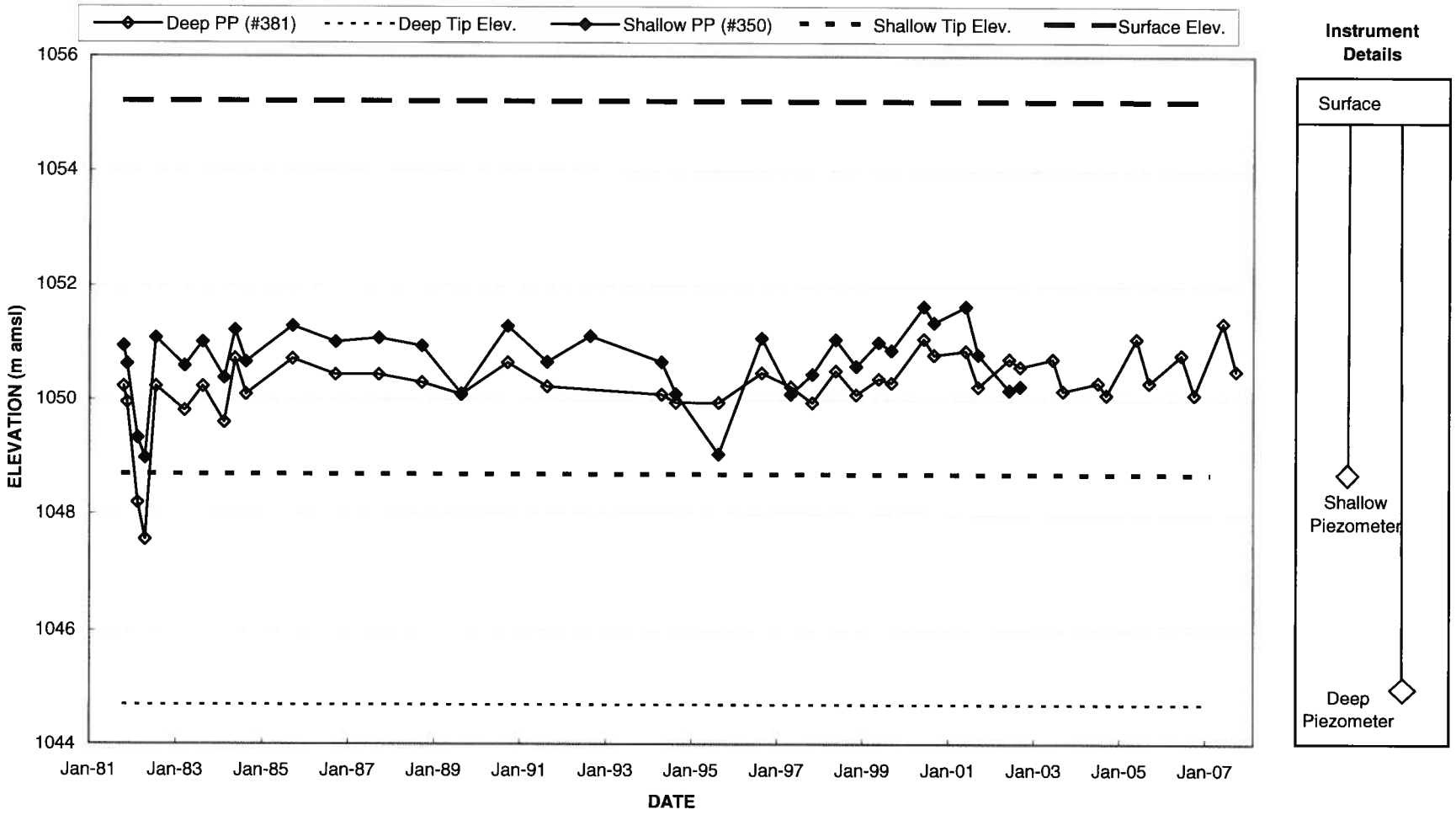
DIVERSION CANAL DIKE
Piezometric Monitoring
CD-13 Pneumatic Piezometer (Shallow Tip)



DIVERSION CANAL DIKE
Piezometric Monitoring
CD-13 Pneumatic Piezometer (Deep Tip)



DIVERSION CANAL DIKE
Piezometric Monitoring
CD-13 Pneumatic Piezometer (Both Tips)



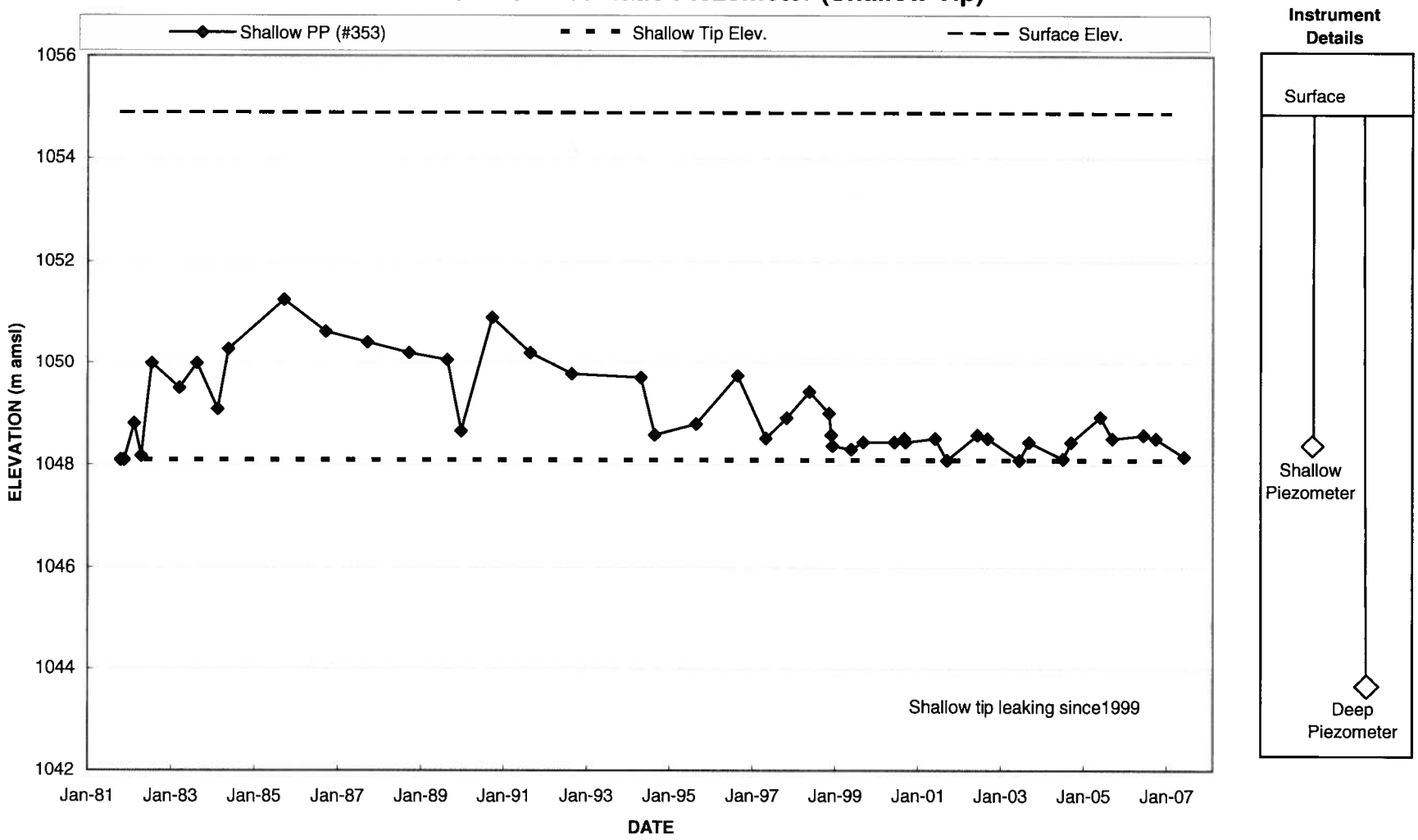
Faro Mine Instrumentation - Diversion Canal Dike

CD-15		Location:	Canal Dike St.1+530	Ground Elevation (m amsl):	1054.882
		Coordinates:	1233.7N, 1028.7E 8V581245 6913275	Shallow Tip Elevation (m amsl):	1048.10
Surface Protector:	yes	Date Installed:	1981	Deep Tip Elevation (m amsl):	1043.30

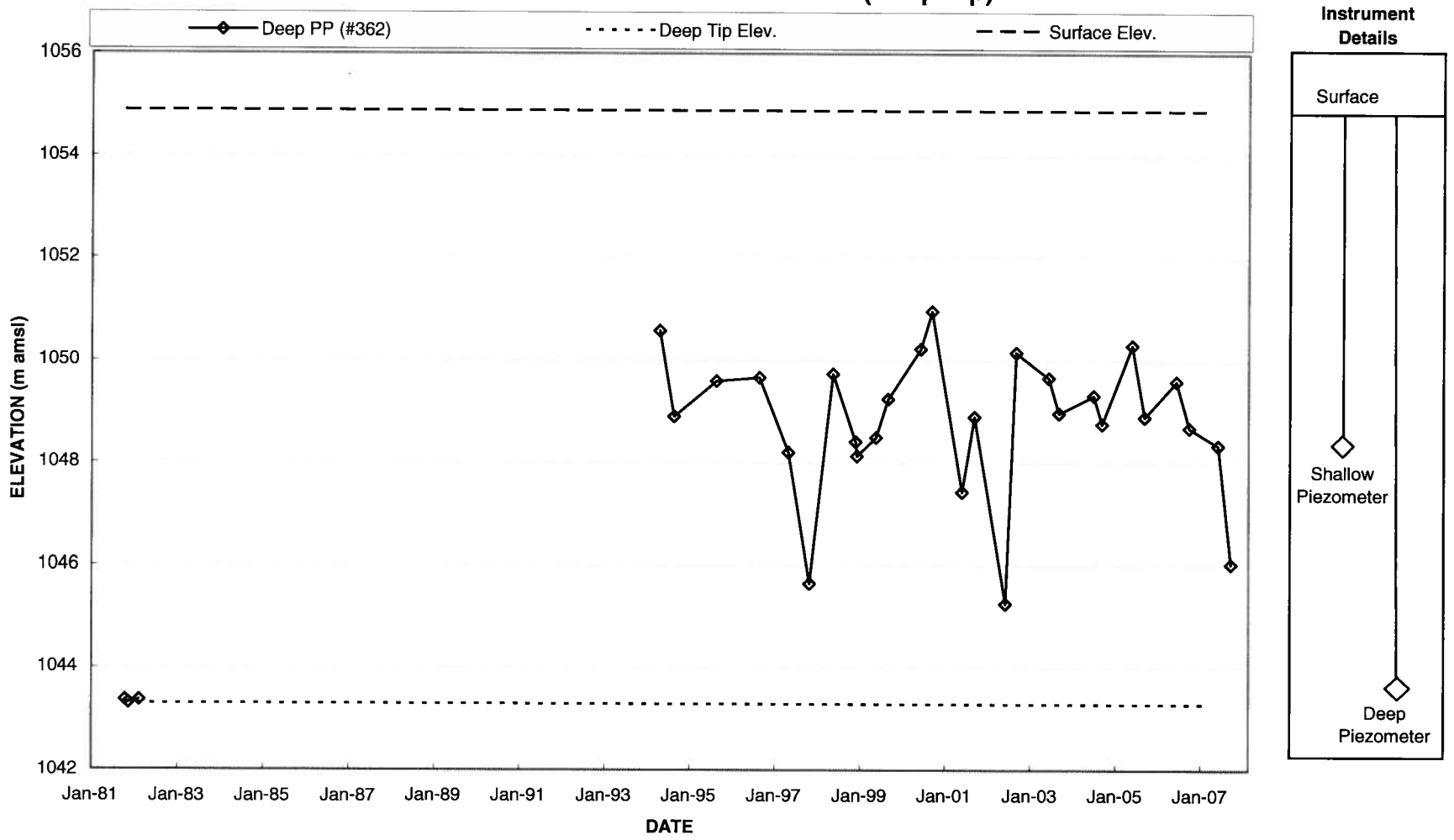
Date	Reading (psi)		Piezometric Elevation (m amsl)		Comments
	Shallow PP (#353)	Deep PP (#362)	Shallow (#353)	Deep (#362)	
Nov-81	0	0.1	1048.1	1043.37	
Dec-81	0	0.02	1048.1	1043.314	
Mar-82	1	0.1	1048.8	1043.37	
May-82	0.1		1048.17		
Aug-82	2.7		1049.99		
Apr-83	2		1049.5		
Sep-83	2.7		1049.99		
Mar-84	1.4		1049.08		
Jun-84	3.1		1050.27		
Oct-85	4.5		1051.25		
Oct-86	3.6		1050.62		
Oct-87	3.3		1050.41		
Oct-88	3		1050.2		
Sep-89	2.8		1050.06		
Jan-90	0.8		1048.66		
Oct-90	4		1050.9		
Sep-91	3		1050.2		
Sep-92	2.4		1049.78		
May-94	2.3	10.4	1049.71	1050.58	
Sep-94	0.7	8	1048.59	1048.9	
Sep-95	1	9	1048.8	1049.6	
Sep-96	2.35	9.1	1049.745	1049.67	
08-May-97	0.6	7.0	1048.52	1048.2	
06-Nov-97	1.17	3.35	1048.919	1045.645	
26-May-98	1.90	9.20	1049.43	1049.74	
15-Nov-98	1.3		1049.01		No return in deep piezo
04-Dec-98	0.7	7.3	1048.59	1048.41	
16-Dec-98	0.4	6.9	1048.38	1048.13	
28-May-99	0.30	7.42	1048.31	1048.494	
11-Sep-99	0.50	8.5	1048.45	1049.25	
14-Jun-00	0.50	9.9	1048.45	1050.23	
09-Sep-00	0.60		1048.52		No return in deep piezo
19-Sep-00	0.50	10.95	1048.45	1050.965	
06-Jun-01	0.60	5.9	1048.52	1047.43	
19-Sep-01	0.00	8.0	1048.1	1048.9	Shallow tip is "dry"
13-Jun-02	0.7	2.8	1048.59	1045.26	
12-Sep-02	0.6	9.8	1048.52	1050.16	
17-Jun-03	0	9.1	1048.1	1049.67	*readings recorded with
12-Sep-03	0.5	8.1	1048.45	1048.97	new piezometer
06-Jul-04	0.04	8.6	1048.128	1049.32	
16-Sep-04	0.5	7.8	1048.45	1048.76	
31-May-05	1.2	10	1048.94	1050.3	
14-Sep-05	0.6	8	1048.52	1048.9	
14-Jun-06	0.7	9	1048.59	1049.6	
2-Oct-06	0.6	7.7	1048.52	1048.69	
06-Jun-07	0.1	7.2	1048.17	1048.34	good flow
24-Sep-07	dry	3.9		1046.03	#353 Dropping - #362 No Bubbles

BGC Engineering Inc.

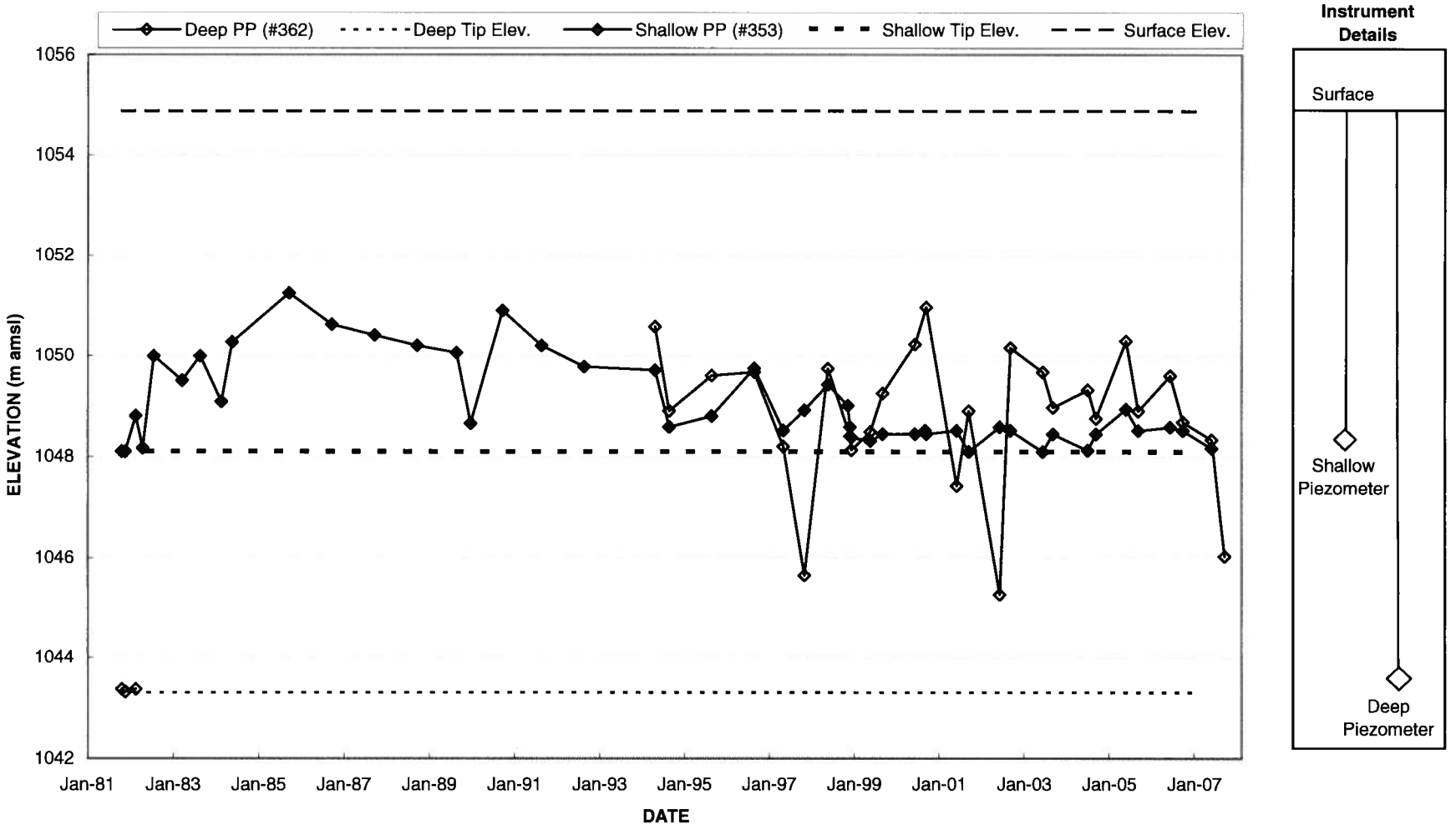
DIVERSION CANAL DIKE
Piezometric Monitoring
CD-15 Pneumatic Piezometer (Shallow Tip)



DIVERSION CANAL DIKE
Piezometric Monitoring
CD-15 Pneumatic Piezometer (Deep Tip)



DIVERSION CANAL DIKE
Piezometric Monitoring
CD-15 Pneumatic Piezometer (Both Tips)

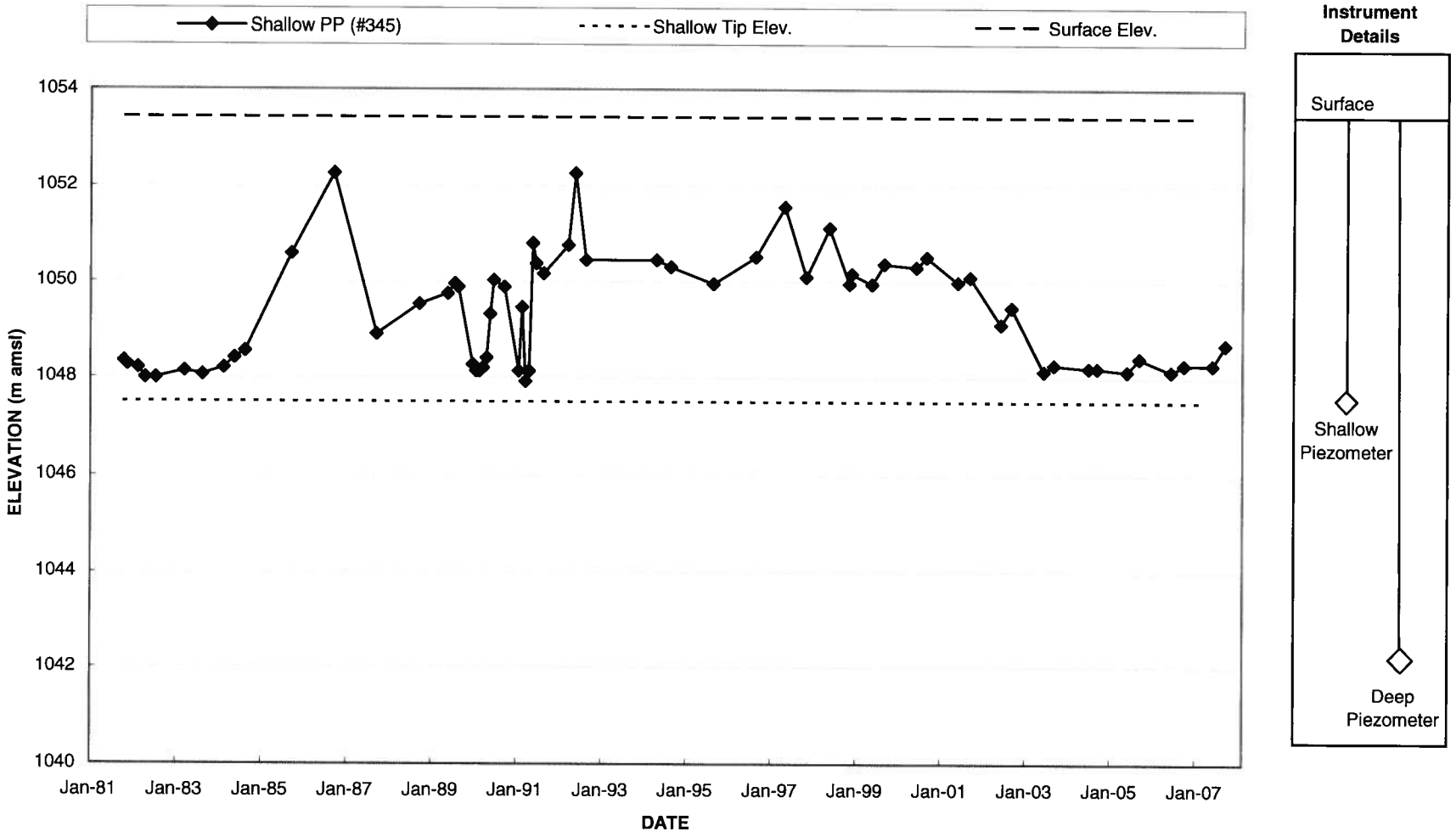


Faro Mine Instrumentation - Diversion Canal Dike

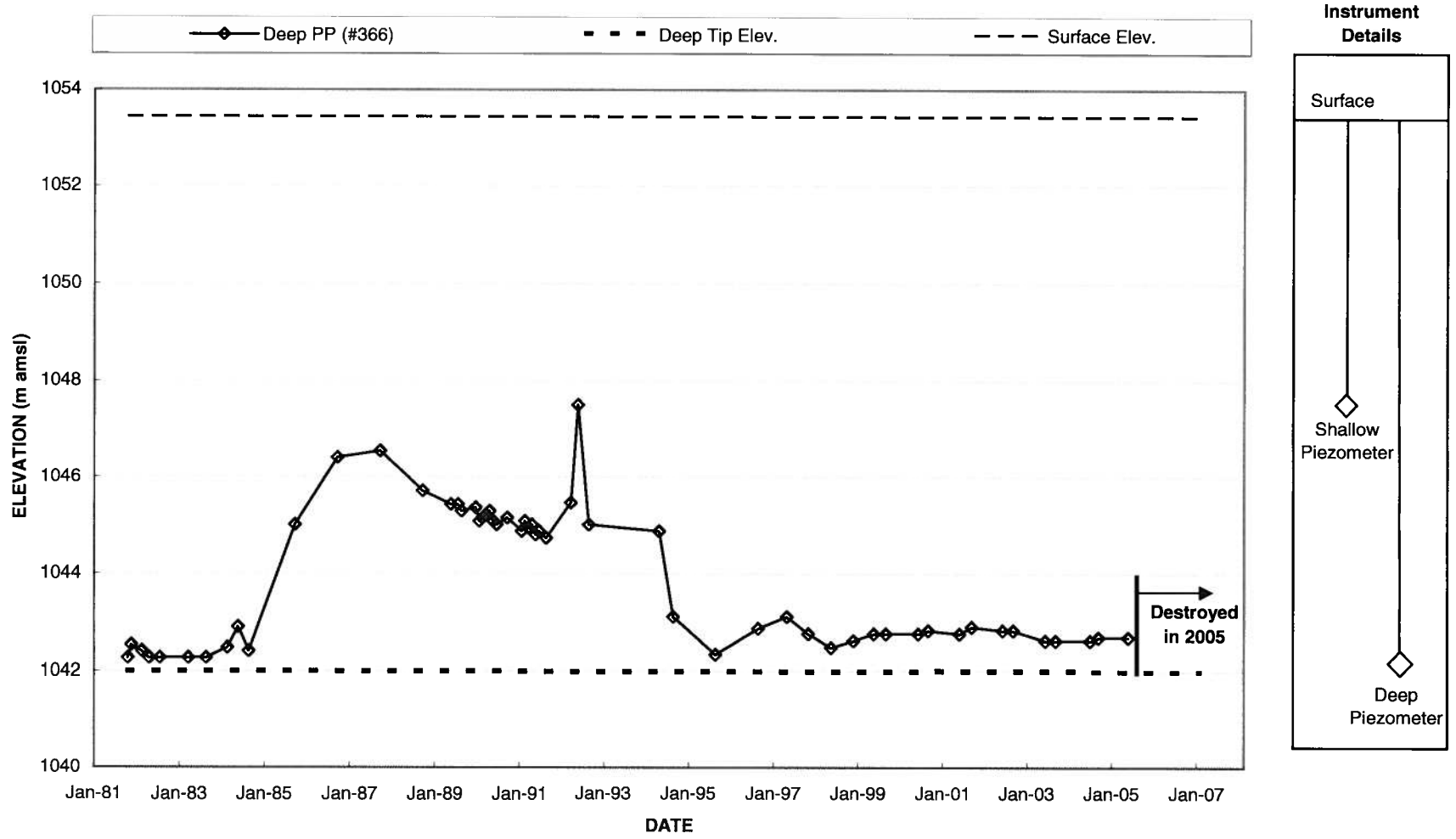
CD-21		Location:	Canal Dike St.2+100	Ground Elevation (m amsl):	1053.447
		Coordinates:	1455.9N, 509.5E 8V580724 6913495	Shallow Tip Elevation (m amsl):	1047.50
Surface Protector:	yes	Date Installed:	1981	Deep Tip Elevation (m amsl):	1042.00

	Reading (psi)		Piezometric Elevation (m amsl)		
Date	Shallow PP (#345)	Deep PP (#366)	Shallow (#345)	Deep (#366)	Comments
Nov-81	1.2	0.4	1048.34	1042.28	
Dec-81	1.1	0.78	1048.27	1042.546	
Mar-82	1	0.6	1048.2	1042.42	
May-82	0.7	0.4	1047.99	1042.28	
Aug-82	0.7	0.4	1047.99	1042.28	
Apr-83	0.9	0.4	1048.13	1042.28	
Sep-83	0.8	0.4	1048.06	1042.28	
Mar-84	1	0.7	1048.2	1042.49	
Jun-84	1.3	1.3	1048.41	1042.91	
Sep-84	1.5	0.6	1048.55	1042.42	
Oct-85	4.4	4.3	1050.58	1045.01	
Oct-86	6.8	6.3	1052.26	1046.41	
Oct-87	2	6.5	1048.9	1046.55	
Oct-88	2.9	5.3	1049.53	1045.71	
Jun-89	3.2	4.9	1049.74	1045.43	
Aug-89	3.5	4.9	1049.95	1045.43	
Sep-89	3.4	4.7	1049.88	1045.29	
Jan-90	1.1	4.8	1048.27	1045.36	
Feb-90	0.9	4.4	1048.13	1045.08	
Mar-90	0.9	4.5	1048.13	1045.15	
Apr-90	1	4.6	1048.2	1045.22	
May-90	1.3	4.7	1048.41	1045.29	
Jun-90	2.6	4.4	1049.32	1045.08	
Jul-90	3.6	4.3	1050.02	1045.01	
Oct-90	3.4	4.5	1049.88	1045.15	
Feb-91	0.9	4.1	1048.13	1044.87	
Mar-91	2.8	4.4	1049.46	1045.08	
Apr-91	0.6	4.2	1047.92	1044.94	
May-91	0.9	4.3	1048.13	1045.01	
Jun-91	4.7	4	1050.79	1044.8	
Jul-91	4.1	4.1	1050.37	1044.87	
Sep-91	3.8	3.9	1050.16	1044.73	
Apr-92	4.65	4.95	1050.755	1045.465	
Jun-92	6.8	7.87	1052.26	1047.509	
Sep-92	4.2	4.3	1050.44	1045.01	
May-94	4.2	4.1	1050.44	1044.87	
Sep-94	4	1.6	1050.3	1043.12	
Sep-95	3.5	0.5	1049.95	1042.35	
Sep-96	4.3	1.25	1050.51	1042.875	
08-May-97	5.8	1.6	1051.56	1043.12	
10-Nov-97	3.7	1.1	1050.09	1042.77	
26-May-98	5.16	0.70	1051.112	1042.49	
15-Nov-98	3.50	n.r.	1049.95		
04-Dec-98	3.80	0.90	1050.16	1042.63	
28-May-99	3.49	1.10	1049.943	1042.77	
11-Sep-99	4.10	1.10	1050.37	1042.77	
14-Jun-00	4.00	1.10	1050.3	1042.77	
09-Sep-00	4.30	1.20	1050.51	1042.84	
06-Jun-01	3.55	1.10	1049.985	1042.77	
19-Sep-01	3.70	1.30	1050.09	1042.91	
13-Jun-02	2.3	1.2	1049.11	1042.84	
12-Sep-02	2.8	1.2	1049.46	1042.84	
17-Jun-03	0.9	0.9	1048.13	1042.63	*readings recorded with new piezometer
12-Sep-03	1.1	0.9	1048.27	1042.63	
06-Jul-04	1	0.9	1048.2	1042.63	#366 Bubbles stpped at 1.7Psi
16-Sep-04	1	1	1048.2	1042.7	
31-May-05	0.9	1	1048.13	1042.7	casing full of water, lots of air over 35 psi
14-Sep-05	1.3		1048.41		#366 - gone
14-Jun-06	0.9		1048.13		#366 - gone
2-Oct-06	1.1		1048.27		#366 - gone
06-Jun-07	1.1	n.r.	1048.27		#366 - gone
24-Sep-07	1.7	n.r.	1048.69		#366 - gone (No Cable)

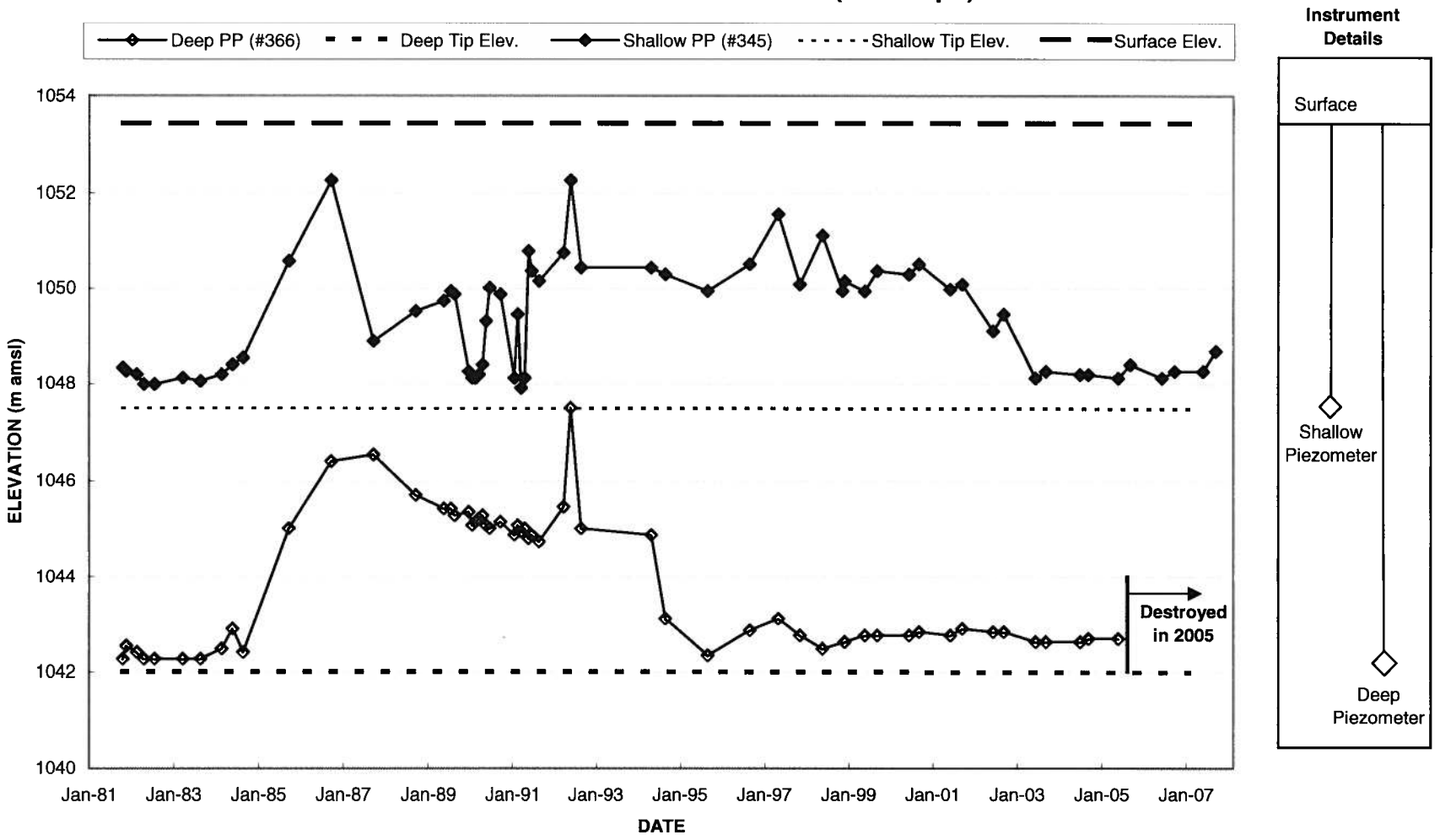
DIVERSION CANAL DIKE
Piezometric Monitoring
CD-21 Pneumatic Piezometer (Shallow Tip)



DIVERSION CANAL DIKE
Piezometric Monitoring
CD-21 Pneumatic Piezometer (Deep Tip)



DIVERSION CANAL DIKE
Piezometric Monitoring
CD-21 Pneumatic Piezometer (Both Tips)

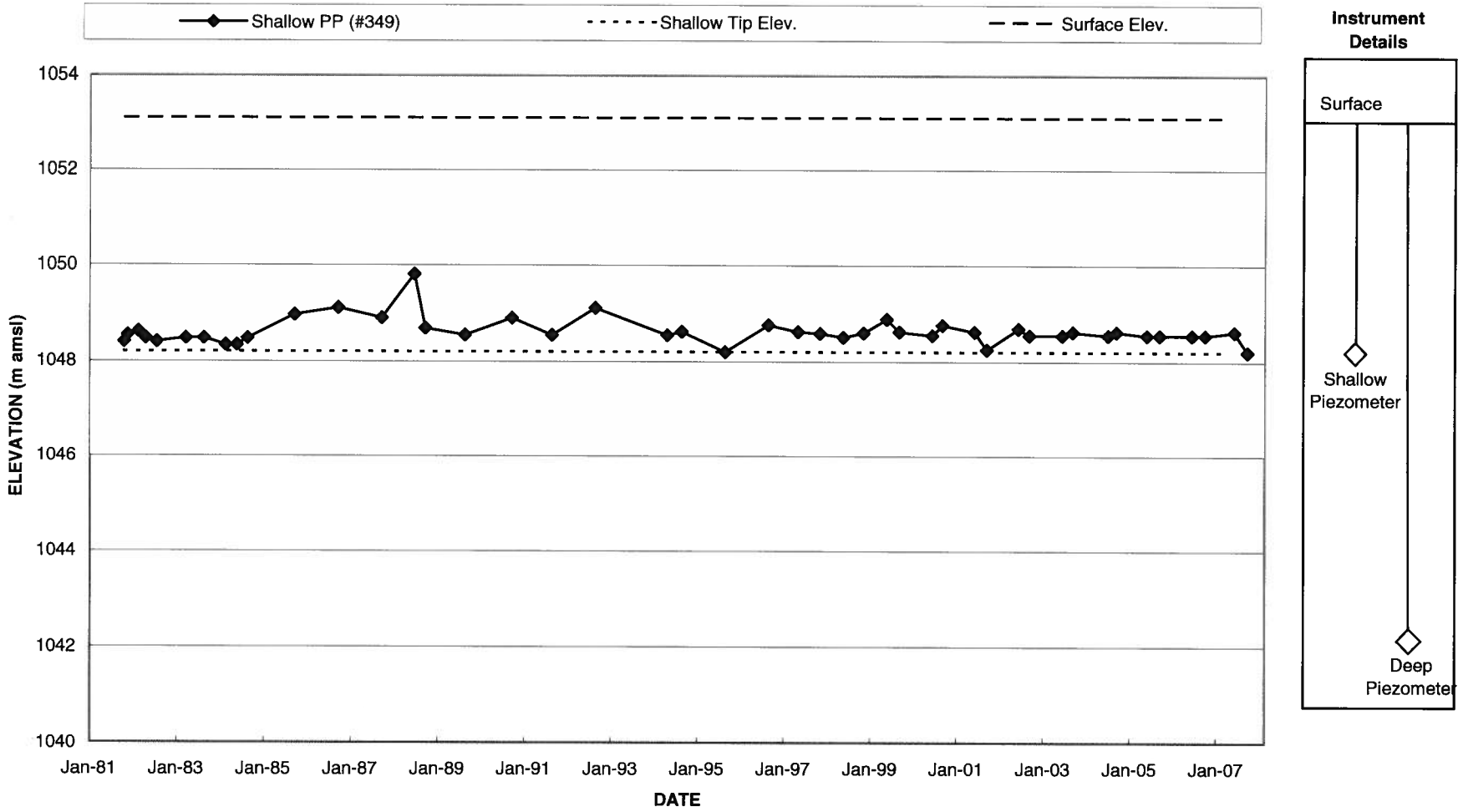


Faro Mine Instrumentation - Diversion Canal Dike

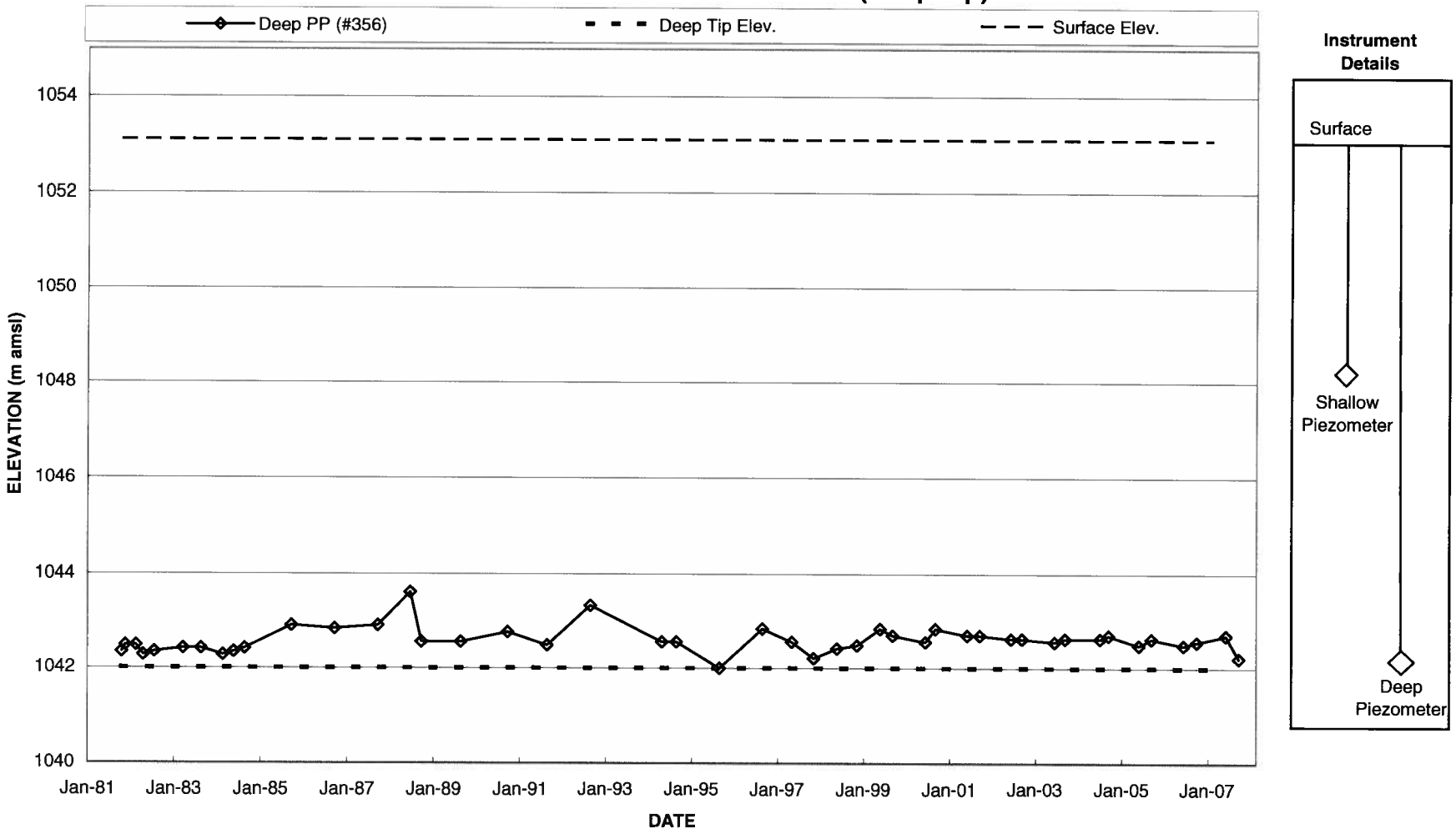
CD-26		Location:	Canal Dike St.2+600	Ground Elevation (m amsl):	1053.10
		Coordinates:	1674.7N, 71.7E 8V580284 6913710	Shallow Tip Elevation (m amsl):	1048.20
Surface Protector:	yes	Date Installed:	1981	Deep Tip Elevation (m amsl):	1042.00

Date	Reading (psi)		Piezometric Elevation (m amsl)		Comments
	Shallow PP (#349)	Deep PP (#356)	Shallow (#349)	Deep (#356)	
Nov-81	0.3	0.5	1048.41	1042.35	
Dec-81	0.5	0.7	1048.55	1042.49	
Mar-82	0.6	0.7	1048.62	1042.49	
May-82	0.4	0.4	1048.48	1042.28	
Aug-82	0.3	0.5	1048.41	1042.35	
Apr-83	0.4	0.6	1048.48	1042.42	
Sep-83	0.4	0.6	1048.48	1042.42	
Mar-84	0.2	0.4	1048.34	1042.28	
Jun-84	0.2	0.5	1048.34	1042.35	
Sep-84	0.4	0.6	1048.48	1042.42	
Oct-85	1.1	1.3	1048.97	1042.91	
Oct-86	1.3	1.2	1049.11	1042.84	
Oct-87	1	1.3	1048.90	1042.91	
Jul-88	2.3	2.3	1049.81	1043.61	
Oct-88	0.7	0.8	1048.69	1042.56	
Sep-89	0.5	0.8	1048.55	1042.56	
Oct-90	1	1.1	1048.90	1042.77	
Sep-91	0.5	0.7	1048.55	1042.49	
Sep-92	1.3	1.9	1049.11	1043.33	
May-94	0.5	0.8	1048.55	1042.56	
Sep-94	0.6	0.8	1048.62	1042.56	
Sep-95	0	0	1048.20	1042.00	
Sep-96	0.8	1.2	1048.76	1042.84	
08-May-97	0.6	0.8	1048.62	1042.56	
10-Nov-97	0.55	0.30	1048.59	1042.21	
26-May-98	0.44	0.60	1048.51	1042.42	
12-Nov-98	0.57	0.70	1048.60	1042.49	
28-May-99	0.98	1.20	1048.89	1042.84	
11-Sep-99	0.60	1.0	1048.62	1042.70	
14-Jun-00	0.50	0.8	1048.55	1042.56	
09-Sep-00	0.80	1.2	1048.76	1042.84	
06-Jun-01	0.60	1.0	1048.62	1042.70	
19-Sep-01	0.07	1.0	1048.25	1042.70	
13-Jun-02	0.7	0.9	1048.69	1042.63	
12-Sep-02	0.5	0.9	1048.55	1042.63	
17-Jun-03	0.5	0.8	1048.55	1042.56	*readings recorded with new piezomete
12-Sep-03	0.6	0.9	1048.62	1042.63	
06-Jul-04	0.5	0.9	1048.55	1042.63	
16-Sep-04	0.6	1	1048.62	1042.70	
31-May-05	0.5	0.7	1048.55	1042.49	good flow
14-Sep-05	0.5	0.9	1048.55	1042.63	
14-Jun-06	0.5	0.7	1048.55	1042.49	
2-Oct-06	0.5	0.8	1048.55	1042.56	wet in casing
06-Jun-07	0.6	1	1048.62	1042.70	good flow
24-Sep-07	0	0.3	1048.20	1042.21	

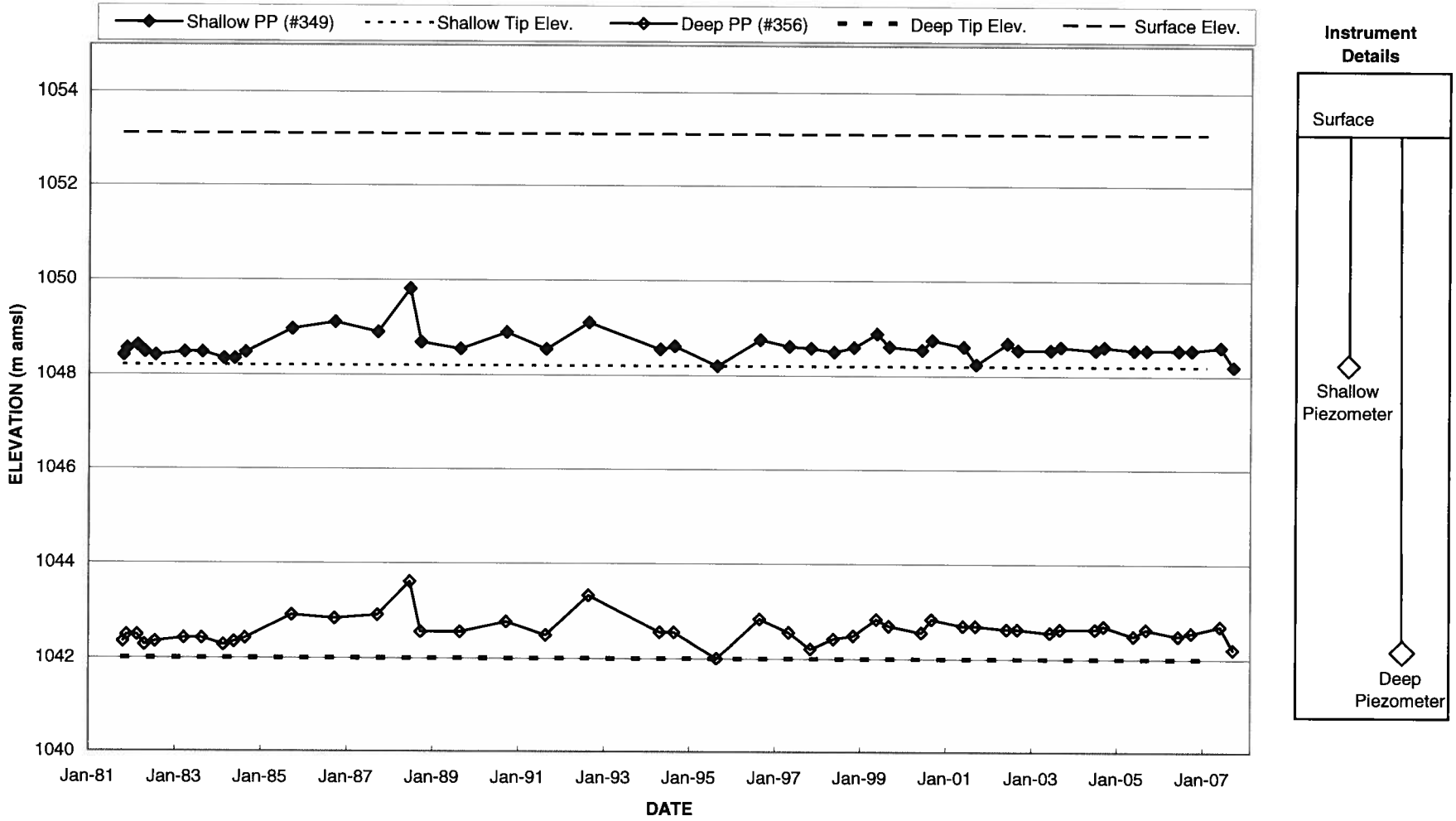
DIVERSION CANAL DIKE
Piezometric Monitoring
CD-26 Pneumatic Piezometer (Shallow Tip)



DIVERSION CANAL DIKE
Piezometric Monitoring
CD-26 Pneumatic Piezometer (Deep Tip)

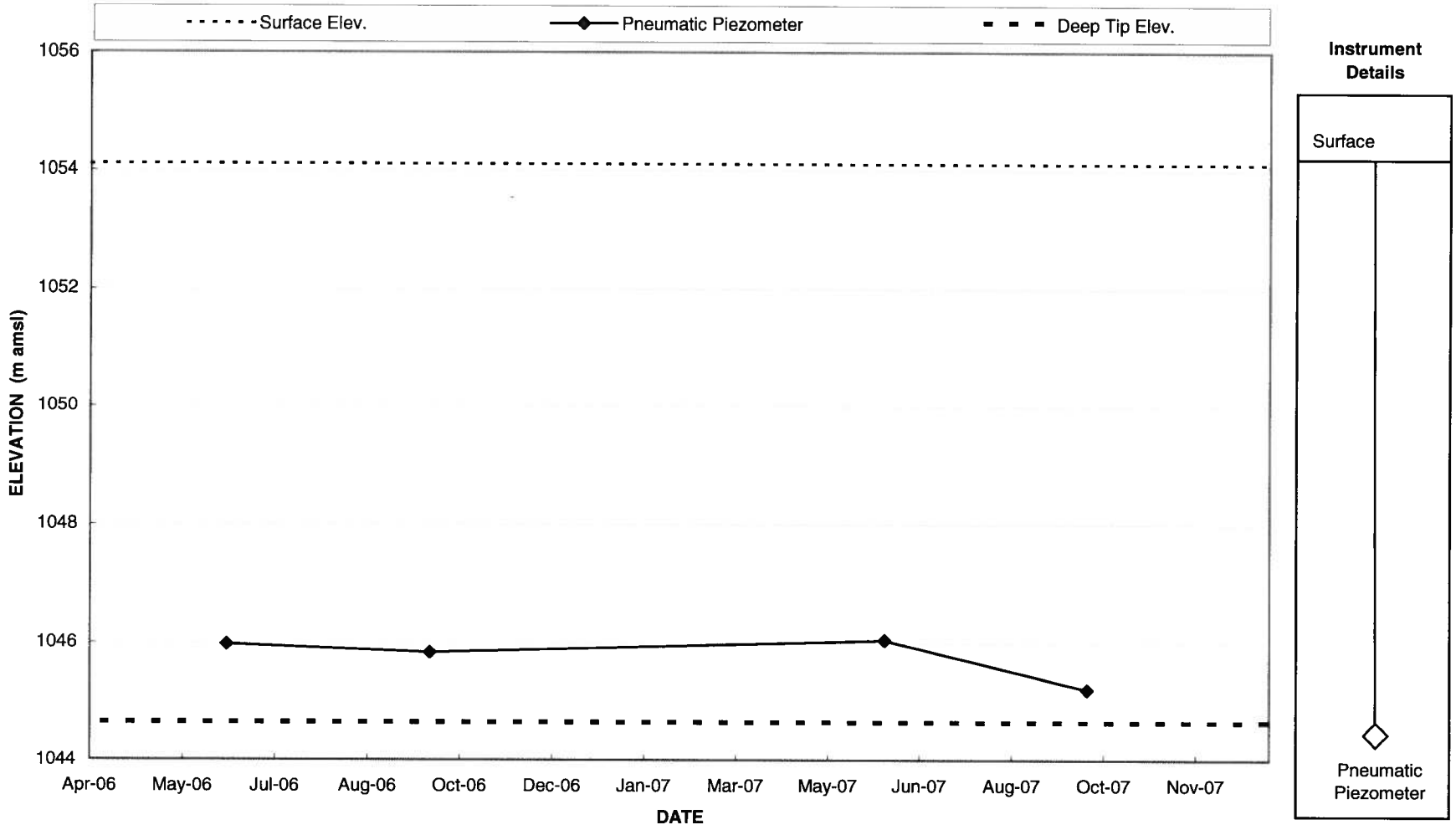


DIVERSION CANAL DIKE
Piezometric Monitoring
CD-26 Pneumatic Piezometers (Both Tips)



BGC05-02		Location:	Canal Dike St.1+900		
		Coordinates:	8V580881 6913412	Ground Elevation (m amsl):	1054.10
Surface Protector:	Yes	Date Installed:	2005	Tip Elevation (m amsl):	1044.65
Date		Reading (psi) (#030137)		Piezometric Elevation (m amsl)	Comments
14-Jun-06		1.9		1045.98	
2-Oct-06		1.7		1045.84	
06-Jun-07		2		1046.05	good flow
24-Sep-07		0.8		1045.21	

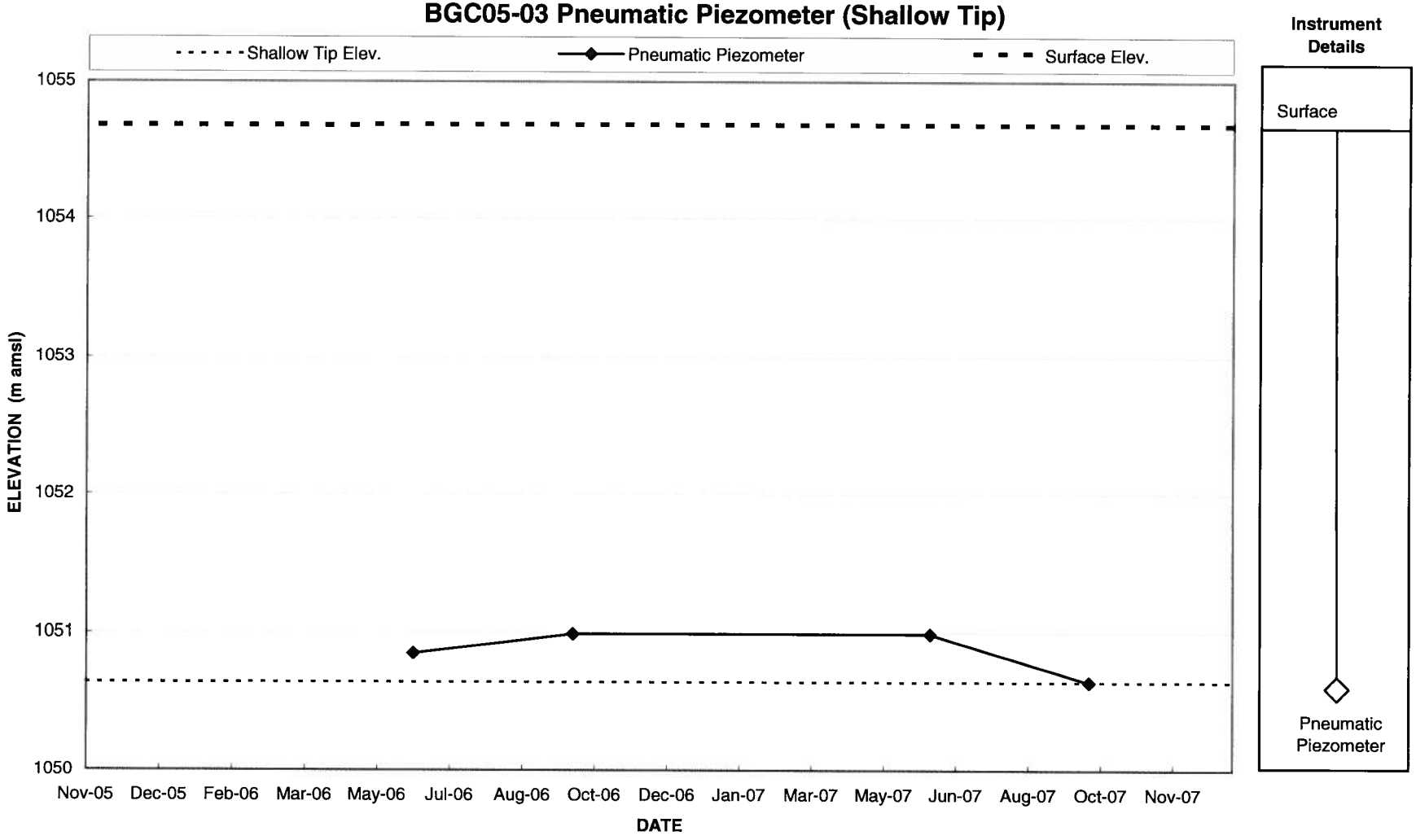
DIVERSION CANAL DIKE
Piezometric Monitoring
BGC05-02 Pneumatic Piezometer (Deep Tip)



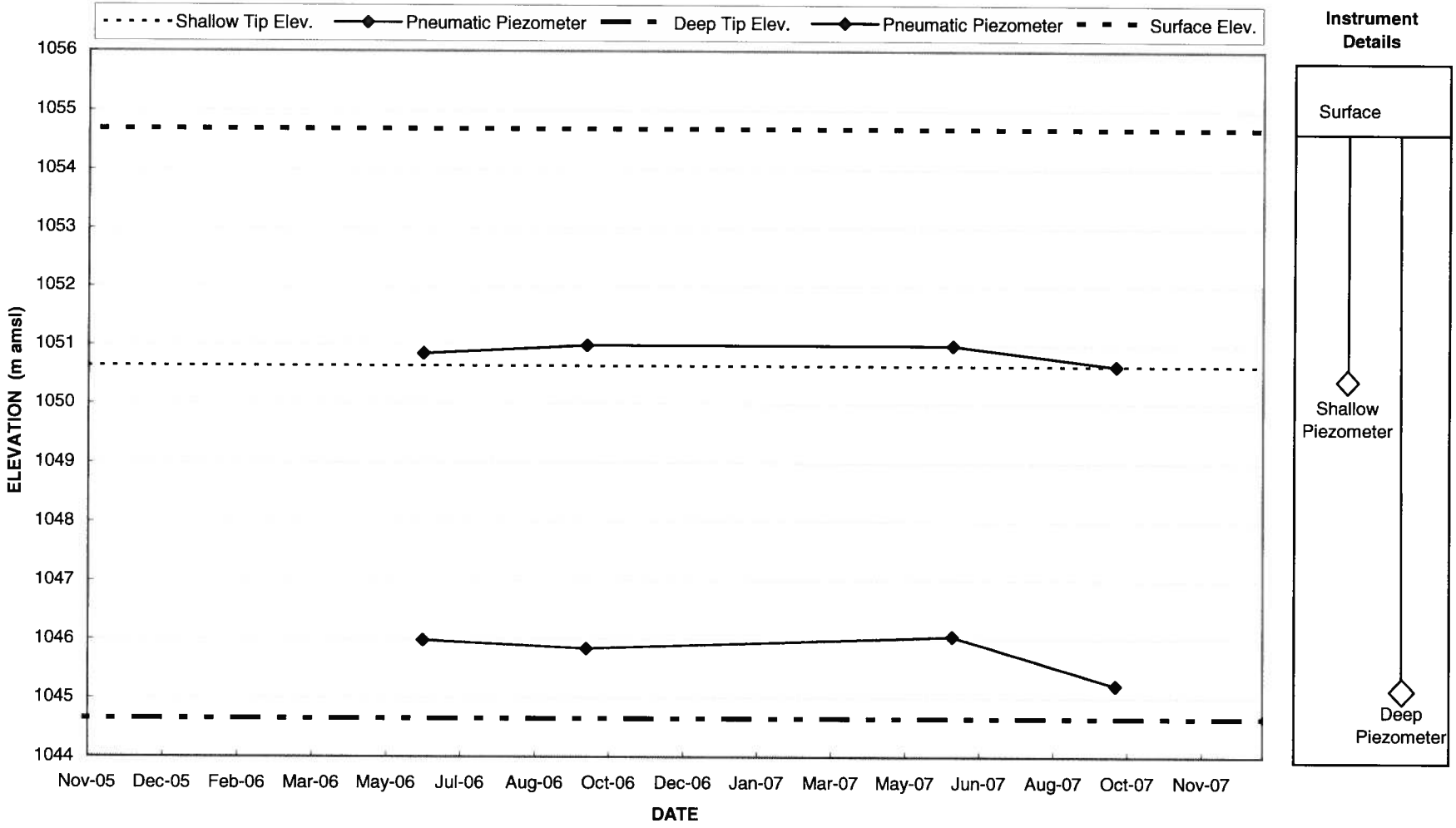
Faro Mine Instrumentation
Canal Dike

BGC05-03		Location:	Canal Dike St.1+900		
		Coordinates:	8V580868 6913418	Ground Elevation (m amsl):	1054.68
Surface Protector:	Yes	Date Installed:	2005	Tip Elevation (m amsl):	1050.64
Date		Reading (psi) (#030139)		Piezometric Elevation (m amsl)	Comments
14-Jun-06		0.3		1050.85	
2-Oct-06		0.5		1050.99	
6-Jun-07		0.5		1050.99	good flow
24-Sep-07		0		1050.64	

DIVERSION CANAL DIKE
Piezometric Monitoring
BGC05-03 Pneumatic Piezometer (Shallow Tip)



DIVERSION CANAL DIKE
Piezometric Monitoring
BGC05-02/-03 Pneumatic Piezometer

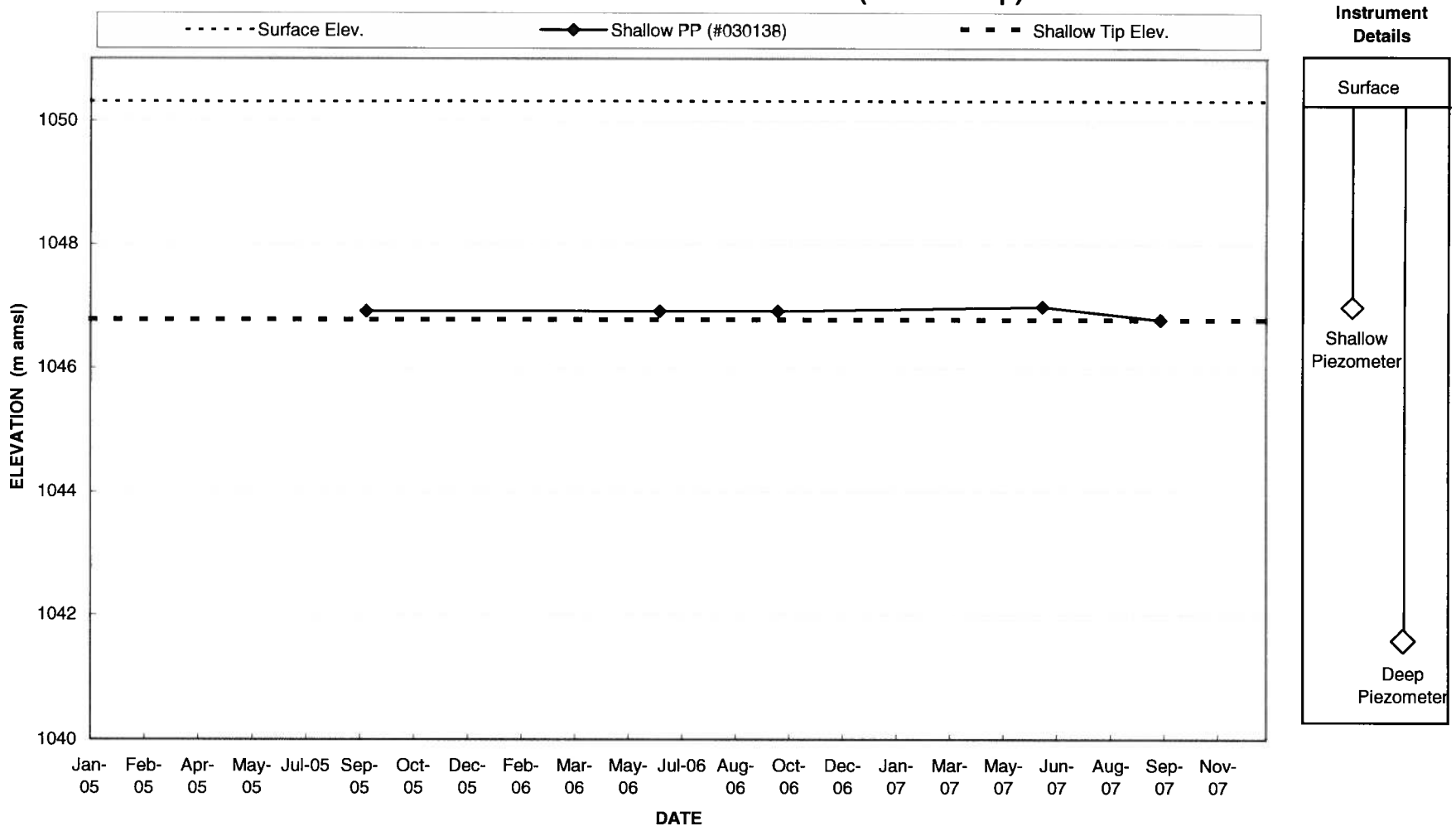


Faro Mine Instrumentation - Diversion Canal Dike

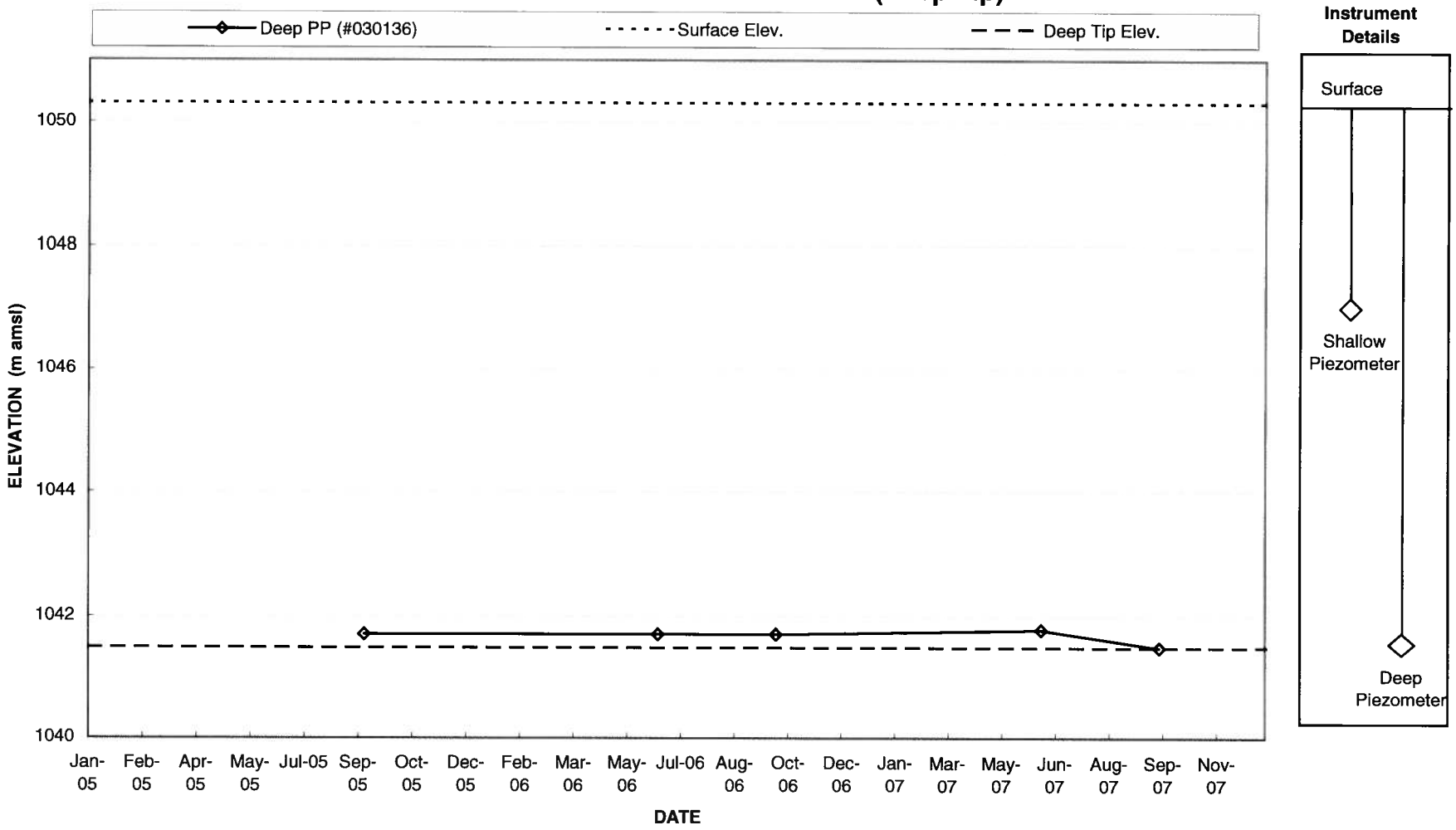
BGC05-06		Location:	Canal Dike St. 2+160 (approx)	Ground Elevation (m amsl):	1050.31
		Coordinates:	8V580715 6913517	Shallow Tip Elevation (m amsl):	1046.78
Surface Protector:	Yes	Date Installed:	2005	Deep Tip Elevation (m amsl):	1041.50

	Reading (psi)		Piezometric Elevation (m amsl)		
	Shallow PP	Deep PP	Shallow	Deep	
Date	(#030138)	(#030136)	(#030138)	(#030136)	Comments
14-Sep-05	0.2	0.3	1046.92	1041.71	
14-Jun-06	0.2	0.3	1046.92	1041.71	
2-Oct-06	0.2	0.3	1046.92	1041.71	
06-Jun-07	0.3	0.4	1046.99	1041.78	good flow
24-Sep-07	0	0	1046.777	1041.50	

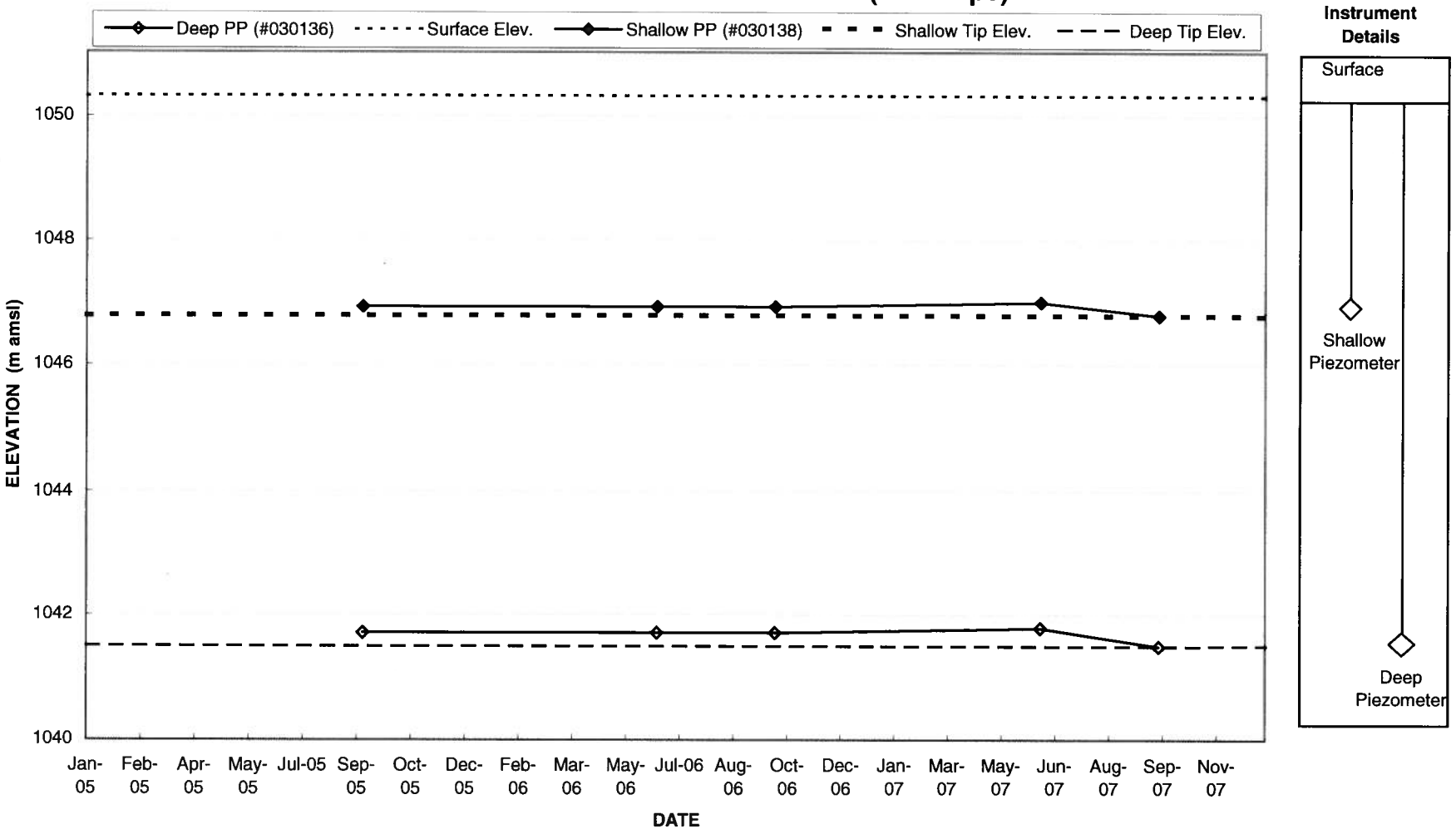
DIVERSION CANAL DIKE
Piezometric Monitoring
BGC05-06 Pneumatic Piezometer (Shallow Tip)



DIVERSION CANAL DIKE
Piezometric Monitoring
BGC05-06 Pneumatic Piezometer (Deep Tip)



DIVERSION CANAL DIKE
Piezometric Monitoring
BGC05-06 Pneumatic Piezometer (Both Tips)



THERMISTORS

Faro Mine Instrumentation
Diversion Canal Dike

CD-10		Location:	Canal Dyke St. 0+990			Elevation (m amsl):	1056.09	Coordinates:	1008.7 mN 1519.7 mE	8V581754 6913048
		Thermistor String #23	Date installed:	1981	Thermistor Type:	Cantec Controls YSI 44007	Ice-Bath Calibration:	applied	Surface Protector:	yes
Depth Correction:	-0.1									

Depth on String	Actual Depth	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)
(m)	(m)	09-Dec-81	31-May-94	13-Sep-94	20-Sep-95	11-Sep-96	13-Sep-99	07-Jun-00	05-Sep-00	13-Jun-02	12-Sep-02	17-Jun-03	12-Sep-03	06-Jul-04	16-Sep-04	31-May-05	12-Oct-05	14-Jun-06	02-Oct-06	06-Jun-07	24-Sep-07
1.0	-0.9	23.70	13.83	12.20	11.98	12.25	11.65	10.54	12.94	12.13	11.85	11.16	11.43	8.32	12.72	11.56	14.90	11.37	13.67	10.58	13.19
2.0	-1.9	16.68	16.31	10.90	11.74	12.47	11.78	16.06	12.77	16.01	11.93	15.03	11.63	10.63	11.94	16.41	13.62	15.63	13.24	16.23	12.4
3.0	-2.9	16.50	17.55	11.39	12.54	13.65	12.93	17.21	13.74	18.77	13.10	17.52	12.58	13.79	12.03	17.78	13.28	17.77	13.45	17.76	18.47
4.0	-3.9	16.13	16.67	12.03	12.94	15.07	14.28	16.84	15.68		13.97	16.79	13.42		12.29	16.98	12.88	16.94	13.63	17.1	15.17
5.0	-4.9	16.24	16.50	13.24	13.77	16.83	16.48	16.75					14.61		13.16	16.80	13.23	16.59	16.49	16.7	12.95
6.0	-5.9	16.31	16.43	14.03	14.40	16.34	15.85	16.64	15.88		15.16	16.48	15.18	16.42	13.83	16.77	13.83	16.65	16.17	16.62	13.95
7.0	-6.9	16.19	16.15	14.19	14.92	15.56	14.96	17.24	15.88	16.63	14.82	16.04	15.03	16.13	13.95	16.54	14.38	16.46	16.3	16.47	13.63
8.0	-7.9	16.19	16.00	13.93	15.26	15.08	14.34	16.20	15.81	16.39	14.75	15.60	14.55	15.80	13.65	16.33	14.84	16.19	16.24	16.33	14.25
9.0	-8.9	16.36	16.31	16.68	15.52	15.38	15.09		16.08	16.72	14.91	16.15	15.08	16.28	13.91	16.67	15.66	16.55	16.81	16.59	14.67
10.0	-9.9	16.21	16.17	14.87	15.31	15.60	15.26		15.77	16.48	14.70	16.06	15.12	16.07	13.97	16.40	15.56	16.34	16.96	16.47	34.4

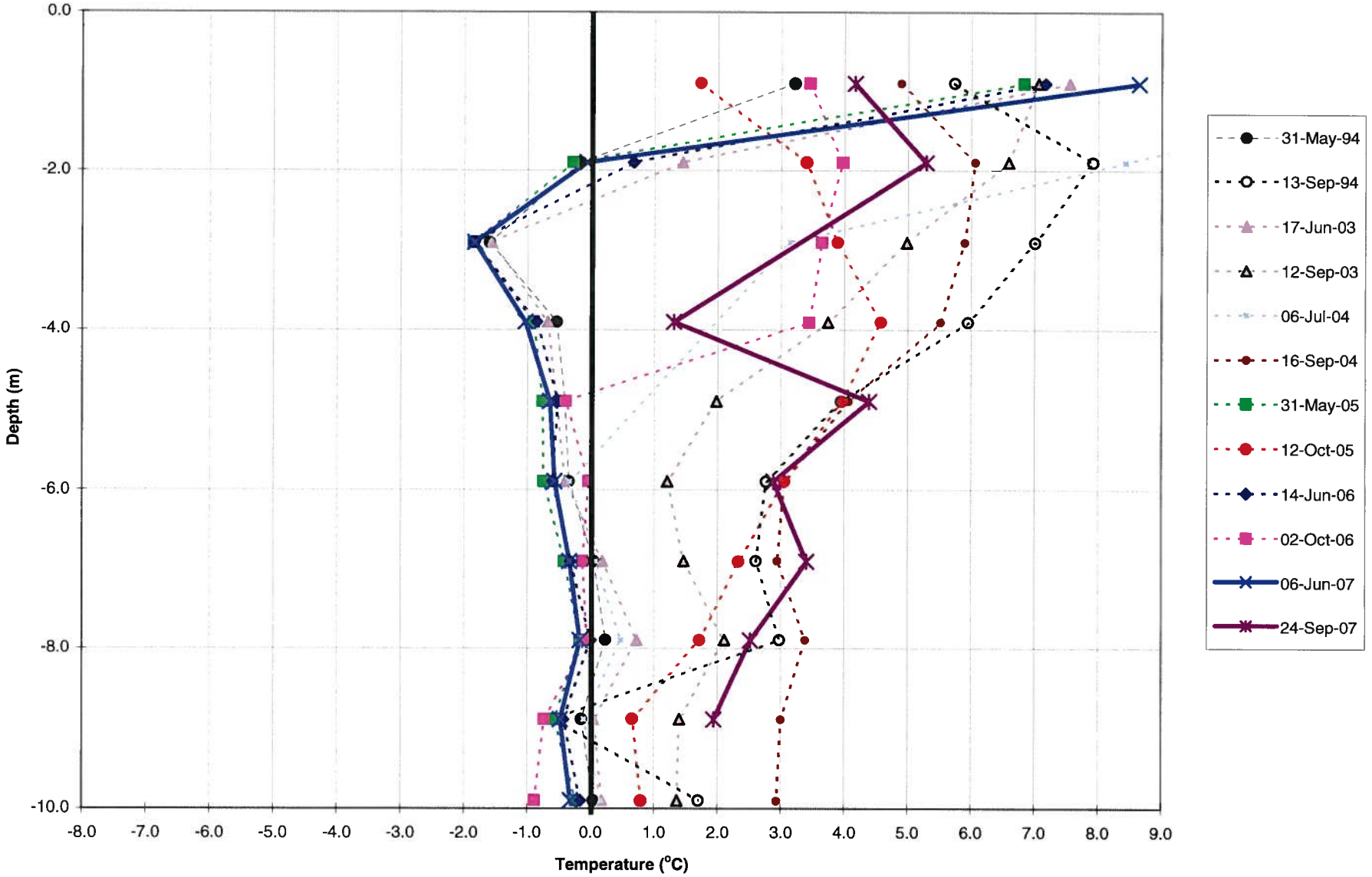
*The initial reading (Nov 15/81) is excluded from the data set because post-installation equilibrium may not have been complete.

Depth on String	Actual Depth	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)
(m)	(m)	09-Dec-81	31-May-94	13-Sep-94	20-Sep-95	11-Sep-96	13-Sep-99	07-Jun-00	05-Sep-00	13-Jun-02	12-Sep-02	17-Jun-03	12-Sep-03	06-Jul-04	16-Sep-04	31-May-05	12-Oct-05	14-Jun-06	02-Oct-06	06-Jun-07	24-Sep-07
1.0	-0.9	-7.20	3.22	5.74	6.11	5.65	6.67	8.72	4.55	5.85	6.33	7.55	7.06	13.67	4.89	6.83	1.73	7.17	3.45	8.65	4.16
2.0	-1.9	-0.60	-0.16	7.91	6.40	5.17	6.33	0.14	4.69	0.20	6.07	1.44	6.59	8.43	6.05	-0.28	3.40	0.67	3.97	-0.07	5.29
3.0	-2.9	-0.40	-1.60	7.00	5.05	3.35	4.43	-1.22	3.22	-2.90	4.17	-1.57	4.99	3.14	5.89	-1.85	3.90	-1.84	3.64	-1.83	-2.59
4.0	-3.9	0.10	-0.54	5.95	4.48	1.44	2.51	-0.74	0.66		2.94	-0.68	3.75		5.52	-0.90	4.57	-0.85	3.44	-1.04	1.31
5.0	-4.9	-0.10	-0.41	3.95	3.16	-0.80	-0.39	-0.70					1.98		4.07	-0.76	3.96	-0.52	-0.40	-0.65	4.39
6.0	-5.9	-0.20	-0.35	2.77	2.25	-0.24	0.36	-0.60	0.32		1.23	-0.41	1.21	-0.34	3.06	-0.75	3.06	-0.61	-0.04	-0.57	2.88
7.0	-6.9	0.00	0.05	2.60	1.61	0.78	1.56	-1.23	0.38	-0.52	1.74	0.18	1.46	0.07	2.94	-0.42	2.34	-0.32	-0.13	-0.34	3.41
8.0	-7.9	0.00	0.23	2.97	1.16	1.40	2.39	-0.01	0.47	-0.24	1.83	0.73	2.11	0.48	3.38	-0.17	1.71	0.00	-0.06	-0.17	2.52
9.0	-8.9	-0.20	-0.14	-0.58	0.83	1.01	1.38		0.13	-0.63	1.62	0.05	1.40	-0.11	3.00	-0.57	0.65	-0.43	-0.73	-0.48	1.94
10.0	-9.9	0.00	0.04	1.69	1.12	0.75	1.18		0.54	-0.33	1.92	0.18	1.36	0.17	2.93	-0.23	0.80	-0.16	-0.89	-0.32	

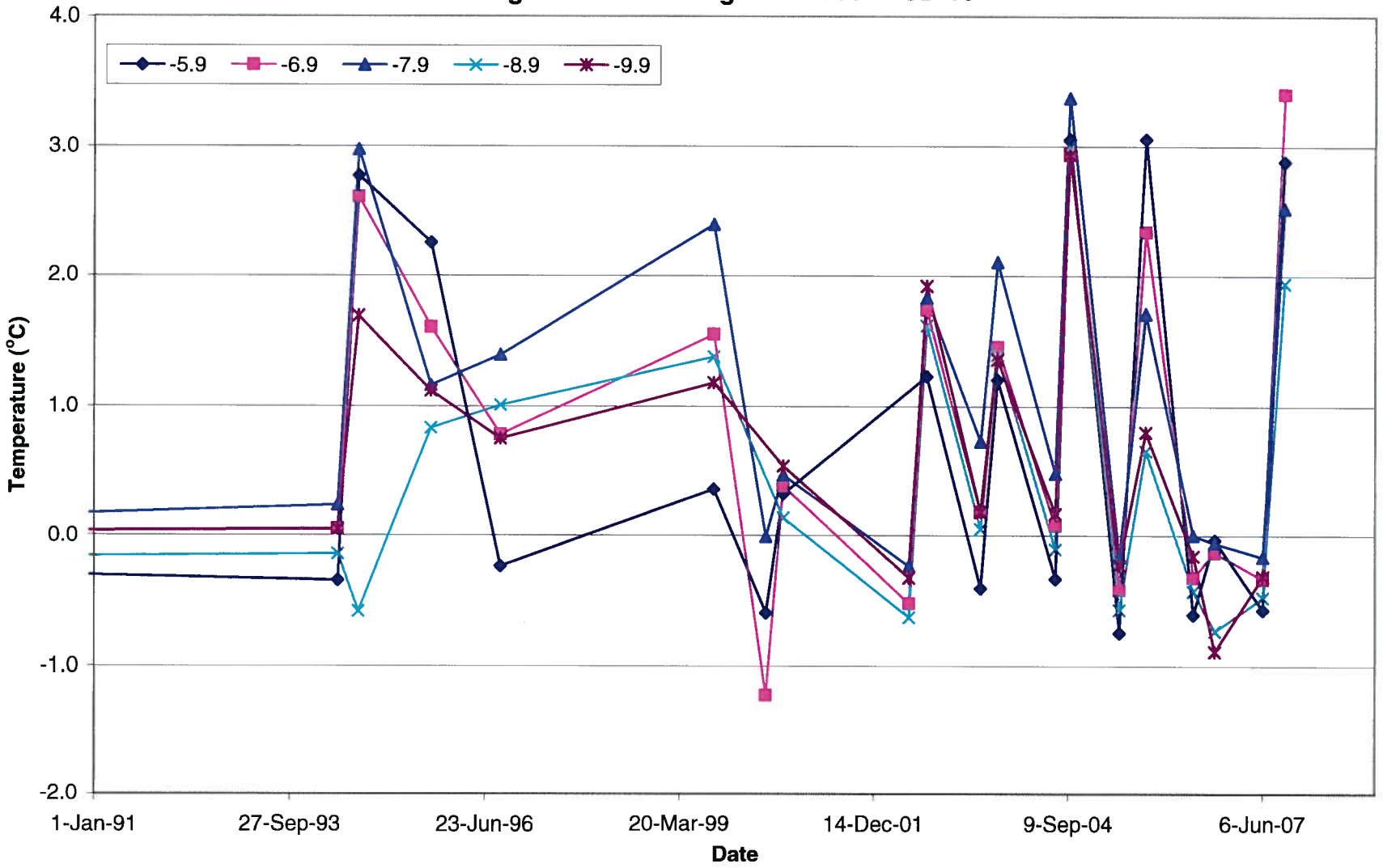
Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)
12-Sep-02	17-Jun-03	12-Sep-03	06-Jul-04	16-Sep-04	31-May-05	12-Oct-05	14-Jun-06	02-Oct-06	06-Jun-07	24-Sep-07
11.85	11.16	11.43	8.32	12.72	11.56	14.90	11.37	13.67	10.58	13.19
11.93	15.03	11.63	10.63	11.94	16.41	13.62	15.63	13.24	16.23	12.4
13.10	17.52	12.58	13.79	12.03	17.78	13.28	17.77	13.45	17.76	18.47
13.97	16.79	13.42		12.29	16.98	12.88	16.94	13.63	17.1	15.17
		14.61		13.16	16.80	13.23	16.59	16.49	16.7	12.95
15.16	16.48	15.18	16.42	13.83	16.77	13.83	16.65	16.17	16.62	13.95
14.82	16.04	15.03	16.13	13.95	16.54	14.38	16.46	16.3	16.47	13.63
14.75	15.60	14.55	15.80	13.65	16.33	14.84	16.19	16.24	16.33	14.25
14.91	16.15	15.08	16.28	13.91	16.67	15.66	16.55	16.81	16.59	14.67
14.70	16.06	15.12	16.07	13.97	16.40	15.56	16.34	16.96	16.47	34.4

Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)
12-Sep-02	17-Jun-03	12-Sep-03	06-Jul-04	16-Sep-04	31-May-05	12-Oct-05	14-Jun-06	02-Oct-06	06-Jun-07	24-Sep-07
6.33	7.55	7.06	13.67	4.89	6.83	1.73	7.17	3.45	8.65	4.16
6.07	1.44	6.59	8.43	6.05	-0.28	3.40	0.67	3.97	-0.07	5.29
4.17	-1.57	4.99	3.14	5.89	-1.85	3.90	-1.84	3.64	-1.83	
2.94	-0.68	3.75		5.52	-0.90	4.57	-0.85	3.44	-1.04	1.31
		1.98		4.07	-0.76	3.96	-0.52	-0.40	-0.65	4.39
1.23	-0.41	1.21	-0.34	3.06	-0.75	3.06	-0.61	-0.04	-0.57	2.88
1.74	0.18	1.46	0.07	2.94	-0.42	2.34	-0.32	-0.13	-0.34	3.41
1.83	0.73	2.11	0.48	3.38	-0.17	1.71	0.00	-0.06	-0.17	2.52
1.62	0.05	1.40	-0.11	3.00	-0.57	0.65	-0.43	-0.73	-0.48	1.94
1.92	0.18	1.36	0.17	2.93	-0.23	0.80	-0.16	-0.89	-0.32	

DIVERSION CANAL DIKE
Geothermal Monitoring
CD-10



Diversion Canal Dike
Geothermal Monitoring
Long Term Monitoring for Nodes in CD-10



Faro Mine Instrumentation
Diversion Canal Dike

CD-15		Location:	Canal Dyke St. 1+530			Elevation (m amsl):	1054.73	Coordinates:	1233.7 mN 1028.7 mE	8V581228 6913287
		Thermistor String #26	Date Installed:	1981	Thermistor Type:	Cantec Controls YSI 44007	Ice-Bath Calibration:	applied	Surface Protector:	yes
Depth Correction:	0.1									
Depth on String	Actual Depth	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)
(m)	(m)	09-Dec-81	31-May-94	13-Sep-94	20-Sep-95	11-Sep-96	13-Sep-99	07-Jun-00	05-Sep-00	25-May-01
1.0	-1.1	20.00	13.84	11.56	11.52	11.93	11.36	13.04	12.03	16.84
2.0	-2.1	16.29	16.58	10.64	11.36	12.23	11.48	16.96	11.74	17.14
3.0	-3.1	15.99	23.62	15.29	16.47	18.13	17.46	24.88	17.37	24.84
4.0	-4.1	15.65		11.34	11.61	13.10	12.17	16.64	12.08	17.01
5.0	-5.1	15.71	16.11	11.81	11.65	13.06	12.38	16.12	11.88	16.21
6.0	-6.1	15.75	15.80	12.17	11.72	13.07	12.50	15.77	12.10	15.90
7.0	-7.1	15.53	15.49	12.61	12.28	13.67	13.09	15.39	12.60	15.52
8.0	-8.1	15.47	15.33	13.42	13.09	14.28	13.78	15.24	13.55	15.40
9.0	-9.1	15.41	15.19	14.09	13.78	14.68	14.38	15.23	14.39	15.40
10.0	-10.1	15.45	15.96	15.21	14.97	15.78	16.64	17.33	16.94	17.64

*The initial reading (Nov 15/81) is excluded from the data set because post-installation equilibrium may not have been complete.

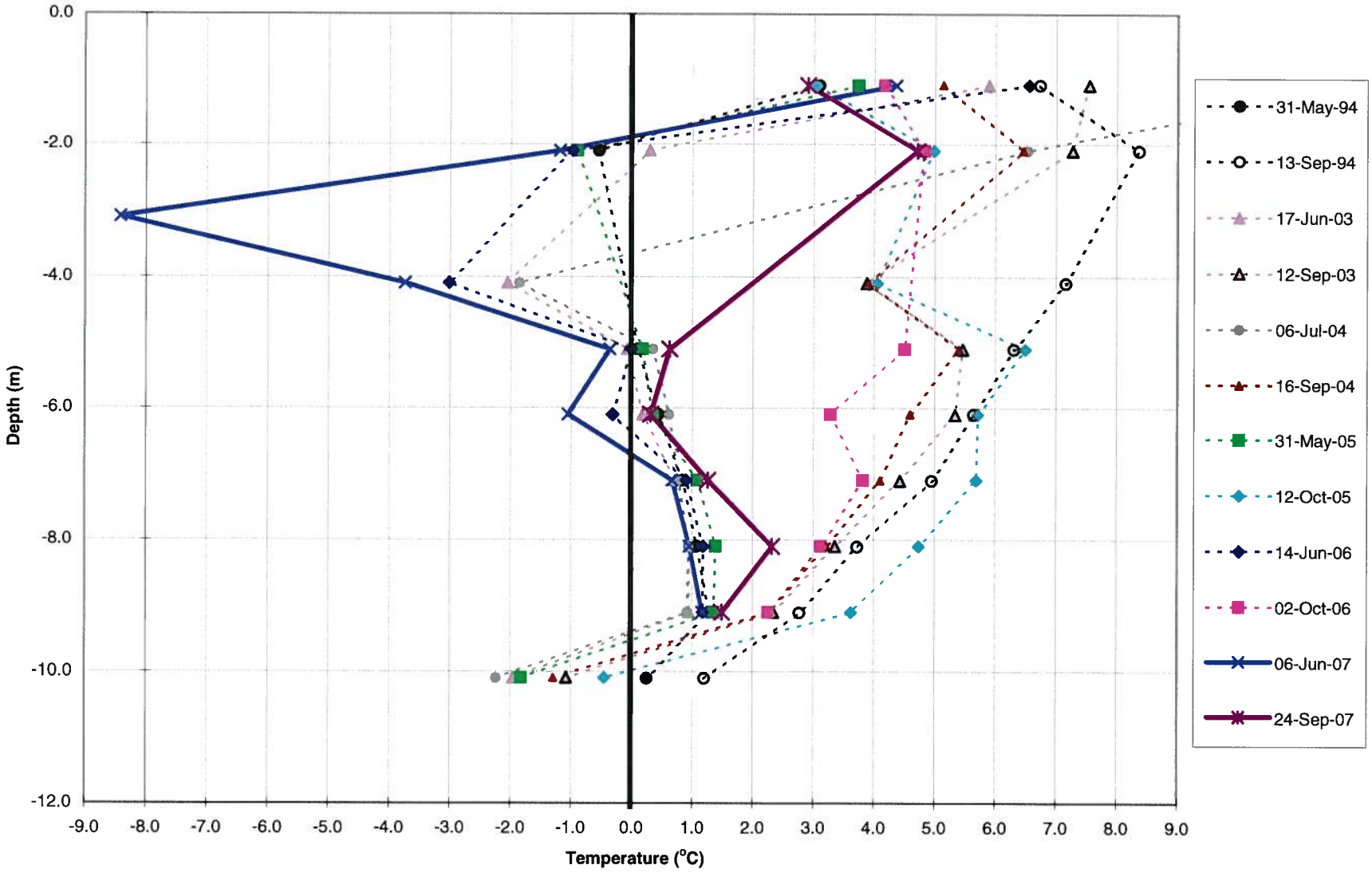
Depth on String	Actual Depth	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)
(m)	(m)	09-Dec-81	31-May-94	13-Sep-94	20-Sep-95	11-Sep-96	13-Sep-99	07-Jun-00	05-Sep-00	25-May-01
1.0	-1.1	-4.10	3.09	6.72	6.79	6.08	7.08	4.28	5.91	-0.78
2.0	-2.1	-0.20	-0.55	8.35	7.01	5.51	6.79	-0.99	6.34	-1.19
3.0	-3.1	0.20								
4.0	-4.1	0.70		7.15	6.67	4.23	5.72	-0.51	5.87	-0.93
5.0	-5.1	0.60	0.11	6.31	6.58	4.27	5.35	0.09	6.19	-0.01
6.0	-6.1	0.50	0.44	5.65	6.41	4.21	5.11	0.48	5.76	0.31
7.0	-7.1	0.80	0.85	4.95	5.48	3.33	4.20	0.98	4.96	0.81
8.0	-8.1	0.90	1.08	3.73	4.23	2.49	3.20	1.20	3.53	0.99
9.0	-9.1	1.00	1.28	2.77	3.22	1.96	2.37	1.23	2.35	1.01
10.0	-10.1	0.90	0.26	1.21	1.52	0.48	-0.56	-1.35	-0.90	-1.69

* The 3 metre depth tip is suspect

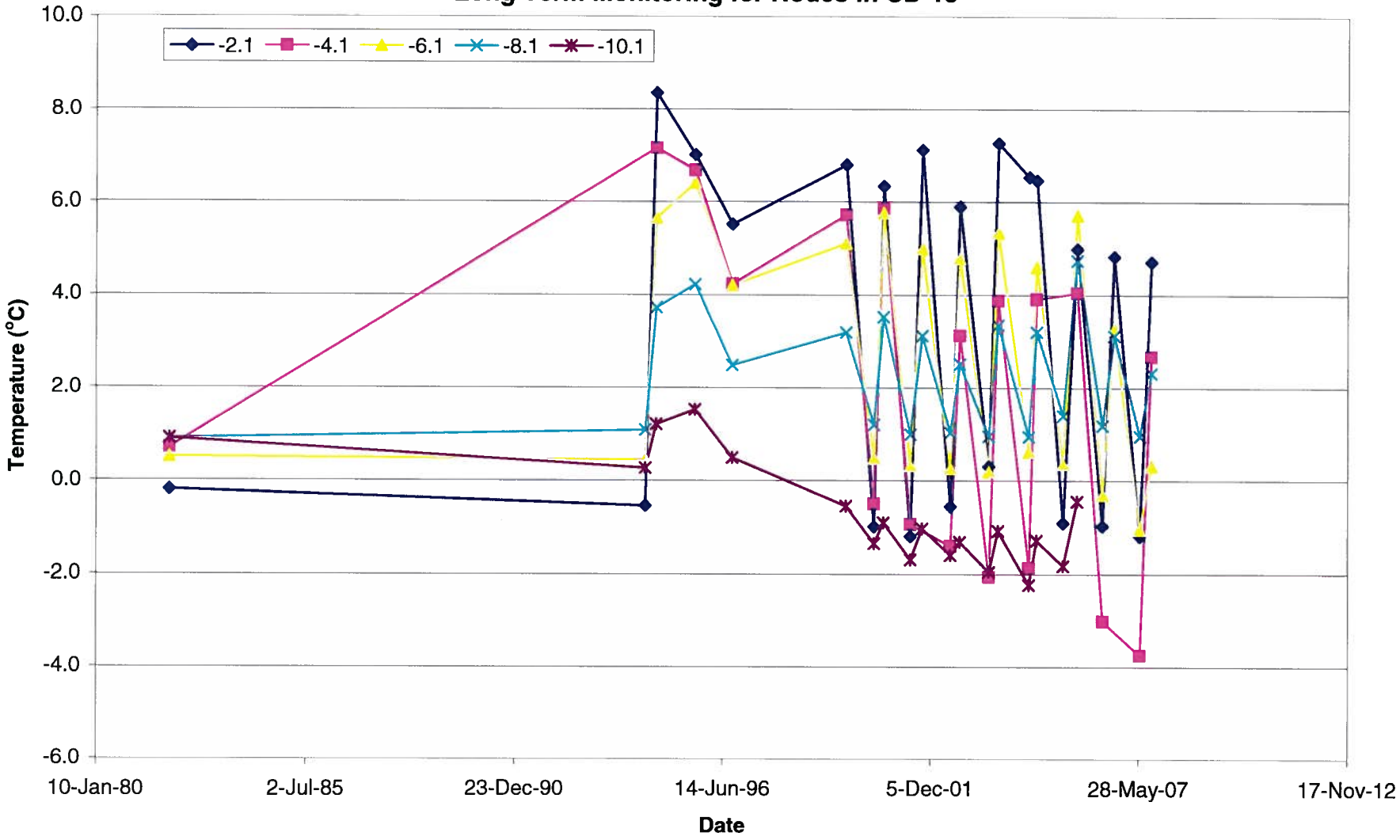
Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)
13-Sep-01	13-Jun-02	12-Sep-02	17-Jun-03	12-Sep-03	06-Jul-04	16-Sep-04	31-May-05	12-Oct-05	14-Jun-06	02-Oct-06	06-Jun-07	24-Sep-07
11.56	12.16	11.57	12.04	11.11	8.87	12.50	13.40	13.87	11.66	13.11	12.99	13.97
11.30	16.59	12.00	15.88	11.22	11.63	11.67	16.89	12.55	16.95	12.65	17.14	12.72
17.05	24.82	18.61	24.71	17.12	21.04	16.94	24.35	17.39	24.52	18.43	25.06	13.08
	17.42	13.84	18.02	13.33	17.84	13.31		13.22	18.93	O/L	19.56	14.08
12.38	16.24	12.68	16.26	12.31	15.91	12.35	16.05	11.70	16.20	12.91	16.5	15.69
12.57	15.95	12.70	16.00	12.36	15.66	12.82	15.87	12.13	16.42	13.69	17.05	15.9
13.10	15.53	13.43	15.59	12.94	15.54	13.15	15.30	12.16	15.45	13.34	15.63	15.17
13.83	15.37	14.26	15.43	13.67	15.44	13.77	15.09	12.76	15.25	13.83	15.43	14.4
14.52	15.37	14.88	15.45	14.40	15.47	14.46	15.13	13.50	15.27	14.46	15.28	15.03
17.05	17.55	17.30	17.88	17.09	18.14	17.27	17.76	16.55	5.17	5.14	*28.1*	

Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)
13-Sep-01	13-Jun-02	12-Sep-02	17-Jun-03	12-Sep-03	06-Jul-04	16-Sep-04	31-May-05	12-Oct-05	14-Jun-06	02-Oct-06	06-Jun-07	24-Sep-07
6.72	5.69	6.70	5.89	7.53	12.20	5.14	3.74	3.05	6.55	4.18	4.36	2.90
7.12	-0.56	5.89	0.30	7.26	6.53	6.46	-0.91	4.98	-0.98	4.82	-1.19	4.71
											-8.42	4.15
	-1.40	3.13	-2.05	3.88	-1.86	3.91		4.05	-3.00		-3.74	2.68
5.35	-0.05	4.87	-0.07	5.47	0.35	5.40	0.18	6.50	0.00	4.50	-0.36	0.63
4.99	0.25	4.79	0.19	5.33	0.61	4.60	0.35	5.71	-0.32	3.28	-1.05	0.31
4.18	0.80	3.68	0.72	4.43	0.78	4.10	1.09	5.68	0.90	3.82	0.67	1.26
3.13	1.03	2.52	0.95	3.36	0.94	3.21	1.39	4.74	1.19	3.13	0.95	2.32
2.18	1.05	1.69	0.95	2.34	0.92	2.26	1.36	3.63	1.18	2.26	1.17	1.49
-1.03	-1.59	-1.31	-1.95	-1.08	-2.23	-1.28	-1.82	-0.45				

DIVERSION CANAL DIKE
Geothermal Monitoring
CD-15



Diversion Canal Dike
Geothermal Monitoring
Long Term Monitoring for Nodes in CD-15



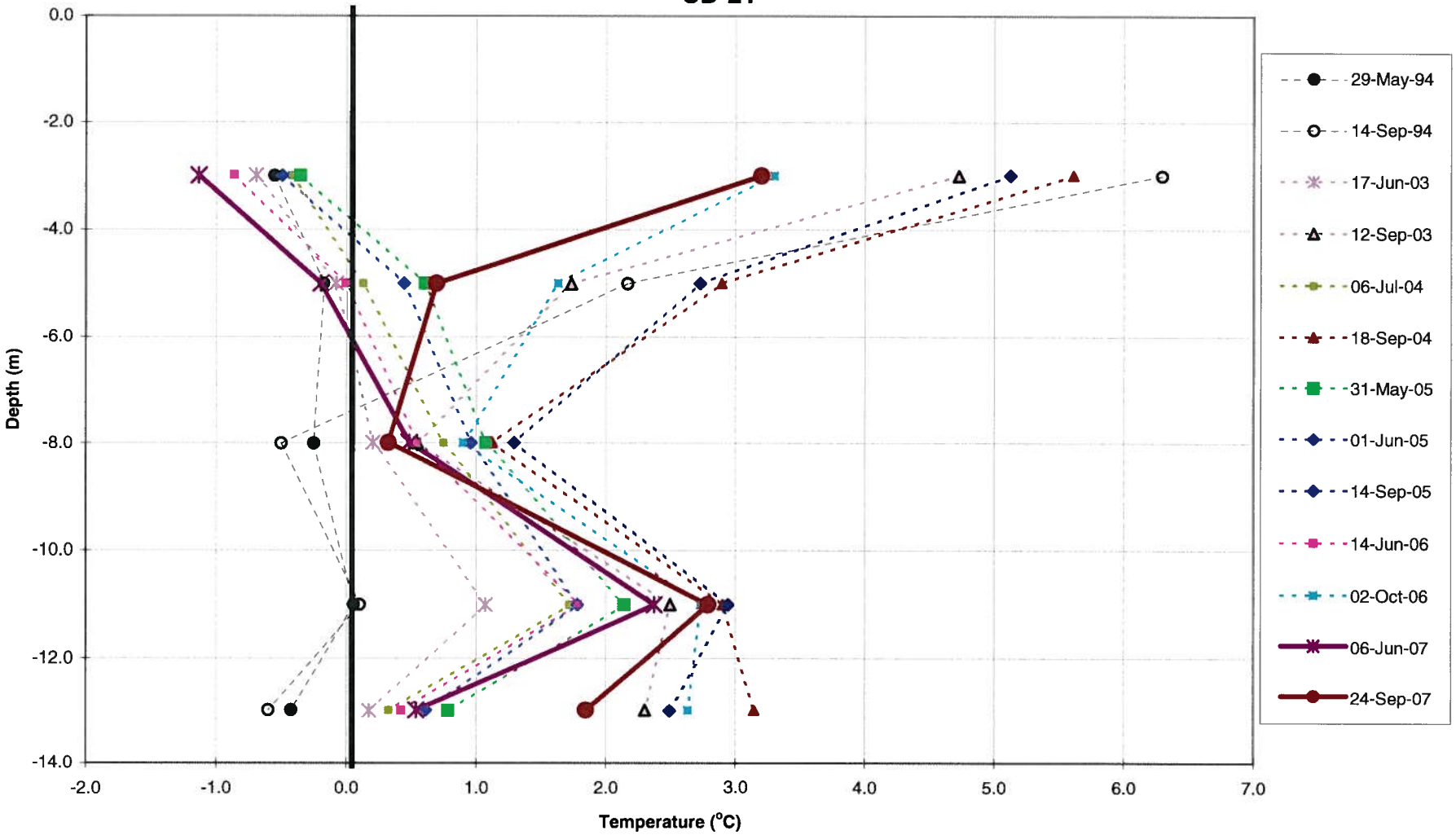
CDtherm_updated_2007
CD-15 Depth chart

CD-21		Location:	Canal Dyke St.2+100			Elevation (m amsl):	1053.34	Coordinates:	1455.9 mN 509.5 mE	8V580708 6913505
		Thermistor String #12	Date Installed:	1981	Thermistor Type:	Cantec Controls YSi 44007	Ice-Bath Calibration:	NO	Surface Protector:	yes
Depth Correction:	0									
Depth on String	Actual Depth	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)
(m)	(m)	09-Dec-82	29-May-94	14-Sep-94	20-Sep-95	13-Sep-96	17-Oct-97	12-Nov-98	13-Sep-99	07-Jun-00
3.0	-3.0	16.58	16.80	11.91	13.12	14.12	14.18	14.78	13.47	16.92
5.0	-5.0	16.56	16.45	14.61	15.04	16.56	15.29	14.65	15.78	16.42
8.0	-8.0	16.89	16.51	16.72	16.68	16.63	16.48	15.79	16.43	16.26
11.0	-11.0	16.87	16.31	16.27	16.31	16.40	16.48	nr	16.13	15.67
13.0	-13.0	16.84	16.69	16.84	16.84	16.83	16.81	16.77	16.59	16.25
Depth on String	Actual Depth	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)
(m)	(m)	09-Dec-82	29-May-94	14-Sep-94	20-Sep-95	13-Sep-96	17-Oct-97	12-Nov-98	13-Sep-99	07-Jun-00
3.0	-3.0	-0.30	-0.55	6.29	4.34	2.87	2.79	1.96	3.81	-0.69
5.0	-5.0	-0.30	-0.17	2.16	1.59	-0.30	1.26	2.11	0.64	-0.14
8.0	-8.0	-0.70	-0.25	-0.50	-0.45	-0.39	-0.22	0.62	-0.16	0.05
11.0	-11.0	-0.60	0.06	0.10	0.06	-0.05	-0.15		0.27	0.84
13.0	-13.0	-0.60	-0.42	-0.60	-0.60	-0.59	-0.56	-0.52	-0.31	0.10

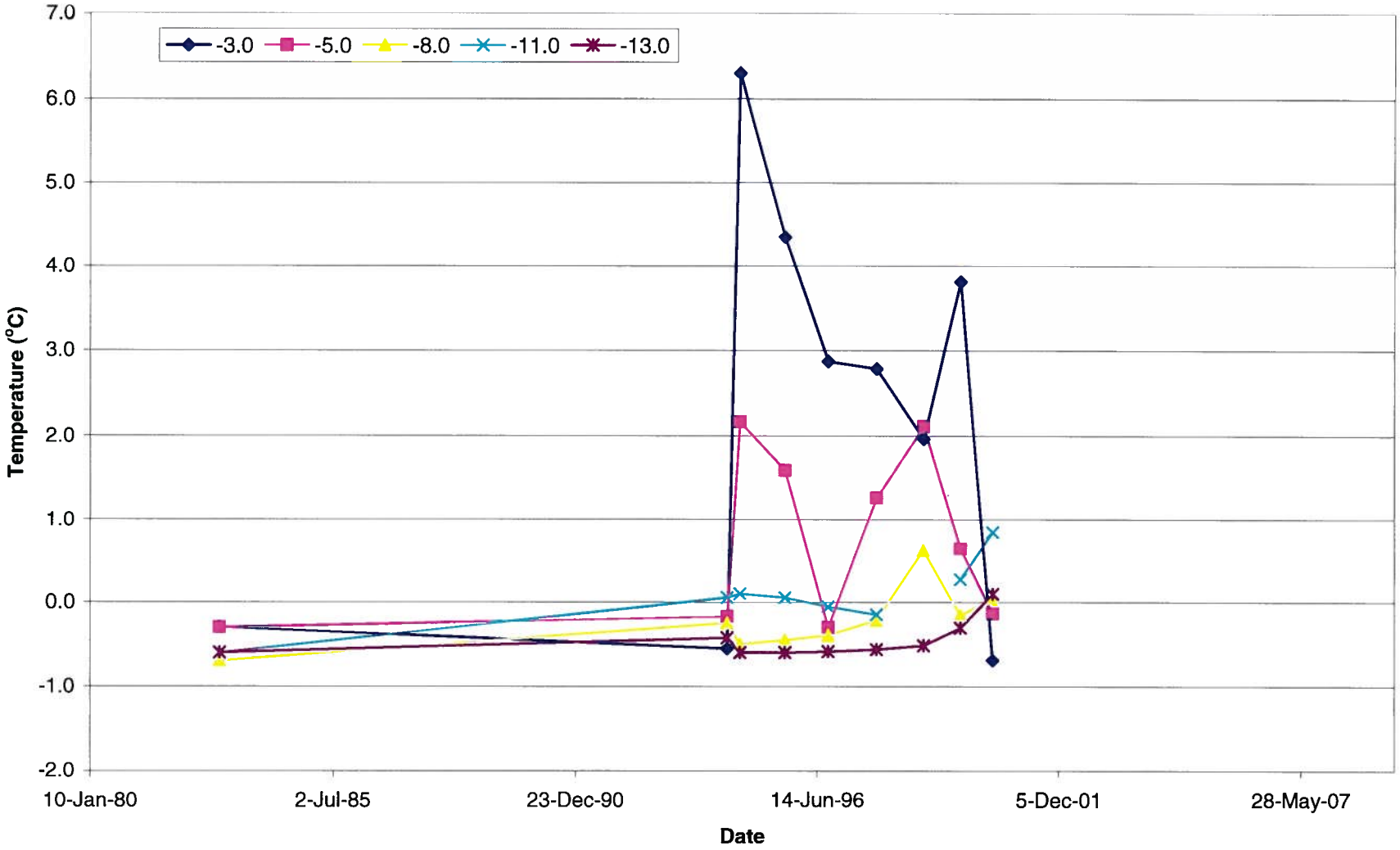
*tip #4 suspect

Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)
05-Sep-00	25-May-01	26-Jun-01	13-Sep-01	13-Jun-02	13-Sep-02	17-Jun-03	12-Sep-03	06-Jul-04	18-Sep-04	31-May-05	01-Jun-05	14-Sep-05	14-Jun-06	02-Oct-06	06-Jun-07	24-Sep-07
13.27	16.96	16.84	12.55	17.13	13.29	16.92	12.87	16.69	12.32	16.63	16.75	12.62	17.07	13.82	17.31	13.89
15.15	16.34	16.40	14.56	16.42	15.13	16.37	14.93	16.20	14.08	15.81	15.94	14.20	16.31	15.01	16.47	15.74
16.23	16.11	16.22	15.99	16.07	15.97	16.13	15.85	15.69	15.39	15.43	15.52	15.26	15.85	15.57	15.9	16.03
15.79	15.53	15.43	15.54	15.38	14.97	15.49	14.41	14.99	14.12	14.67	14.94	14.09	14.94	14.24	14.5	14.2
16.37	16.00	16.12	16.17	15.93	15.60	16.18	14.53	16.06	13.93	15.69	15.83	14.39	15.98	14.29	15.89	14.87
Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)
05-Sep-00	25-May-01	26-Jun-01	13-Sep-01	13-Jun-02	13-Sep-02	17-Jun-03	12-Sep-03	06-Jul-04	18-Sep-04	31-May-05	01-Jun-05	14-Sep-05	14-Jun-06	02-Oct-06	06-Jun-07	24-Sep-07
4.11	-0.74	-0.60	5.23	-0.93	4.08	-0.69	4.73	-0.42	5.61	-0.35	-0.49	5.12	-0.86	3.30	-1.14	3.20
1.45	-0.04	-0.11	2.23	-0.14	1.47	-0.08	1.73	0.13	2.90	0.61	0.45	2.73	0.00	1.63	-0.20	0.69
0.08	0.23	0.09	0.37	0.28	0.40	0.20	0.55	0.75	1.13	1.07	0.96	1.29	0.55	0.90	0.48	0.32
0.69	1.02	1.14	1.00	1.21	1.74	1.07	2.50	1.72	2.90	2.14	1.78	2.94	1.78	2.73	2.37	2.79
-0.05	0.40	0.25	0.19	0.49	0.90	0.18	2.30	0.33	3.14	0.79	0.61	2.49	0.43	2.63	0.54	1.84

DIVERSION CANAL DIKE
Geothermal Monitoring
CD-21



Diversion Canal Dike
Geothermal Monitoring
Long Term Monitoring for Nodes in CD-21



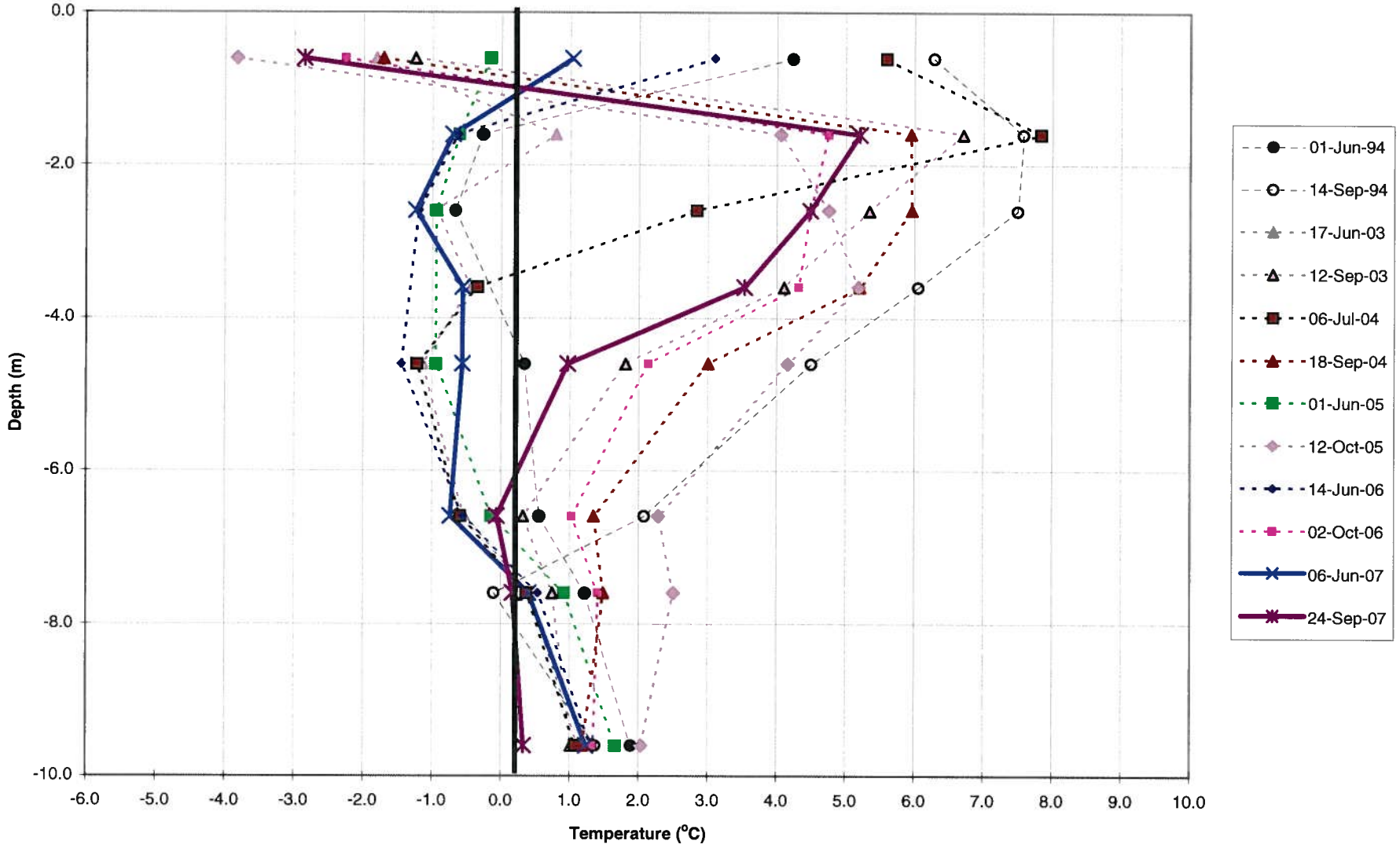
CD-26		Location:	Canal Dyke St.2+600	Elevation (m amsl):	1053.1			Coordinates:	1674.7 mN, 71.7 mE	8V580269 6913720
		Thermistor String #17	Date Installed:	1981	Thermistor Type:	Cantec Controls YSI 44007	Ice-Bath Calibration:	applied	Surface Protector:	yes
Depth Correction:	-0.4									

Depth on String	Actual Depth	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)
(m)	(m)	09-Dec-81	01-Jun-94	14-Sep-94	21-Sep-95	13-Sep-96	14-Sep-99	13-Jun-02	12-Sep-02	17-Jun-03	12-Sep-03	06-Jul-04	18-Sep-04	01-Jun-05	12-Oct-05	14-Jun-06	02-Oct-06	06-Jun-07	24-Sep-07
1.0	-0.6	22.70	13.14	11.87	11.54	11.98	11.51	14.85	15.64	17.85	17.34	12.28	17.76	16.40	19.82	13.91	18.27	15.43	18.84
2.0	-1.6	16.32	16.38	11.07	11.52	11.97	11.63	16.08	11.97	15.52	11.55	10.93	11.99	16.67	13.17	16.68	12.72	16.75	12.44
3.0	-2.6	16.20	16.76	11.14	12.01	12.77	12.40	17.06	12.99	16.99	12.38	14.03	12.01	17.00	12.75	17.22	12.92	17.26	12.92
4.0	-3.6	16.17		11.94	12.60	13.59	13.26	16.60	13.83	16.54	13.15	16.46	12.45		12.46		13.03	16.67	13.55
5.0	-4.6	16.24	15.88	12.88	13.36	14.58	14.38	16.99	15.33	17.13	14.74	17.20	13.88	16.96	13.10	17.40	14.53	16.67	15.42
6.0	-5.6	16.28	17.71	15.80	18.08	22.69	27.08	35.50	34.25	37.50	35.00	40.20	34.00	44.20	38.00		42.3	48.3	44.06
7.0	-6.6	16.43	15.73	14.56	14.73	15.61	15.69	16.51	16.23	16.63	15.92	16.68	15.11	16.30	14.41	16.65	15.37	16.82	16.25
8.0	-7.6	16.50	15.19	16.25	14.73	15.35	15.42	15.70	15.73	15.83	15.56	15.86	14.99	15.43	14.24	15.73	15.08	15.87	16.06
9.0	-8.6	16.46	15.33	15.60	15.38	15.80	16.10	16.90	17.17	17.38	17.43	17.99	17.62	18.31	18.06	19.84	19.38	19.85	20.78
10.0	-9.6	16.24	14.68	15.07	14.91	15.01	15.04	15.11	15.34	15.26	15.34	15.29	15.21	14.85	14.57	15.12	15.13	15.21	15.93

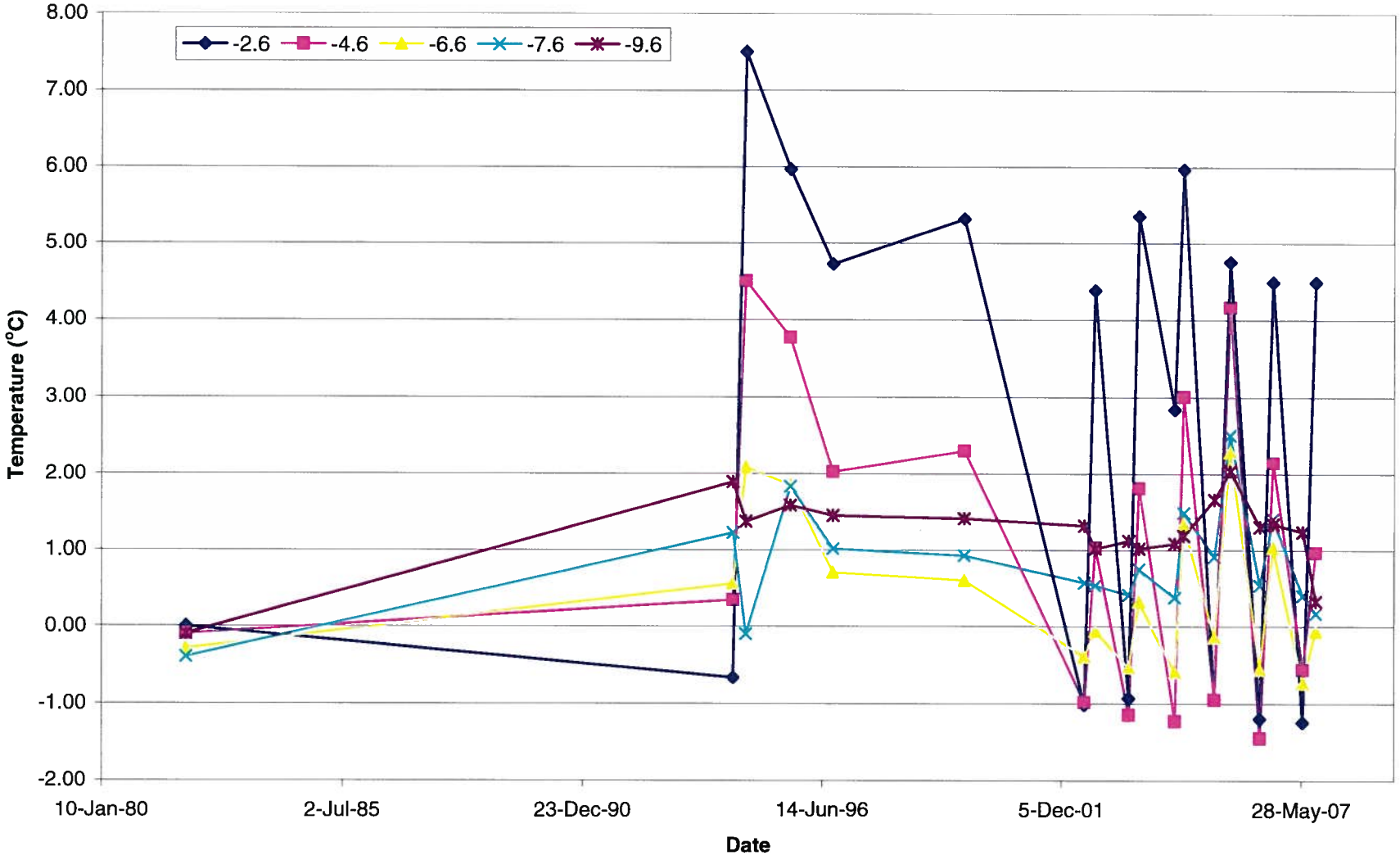
Depth on String	Actual Depth	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)
(m)	(m)	09-Dec-81	01-Jun-94	14-Sep-94	21-Sep-95	13-Sep-96	14-Sep-99	13-Jun-02	12-Sep-02	17-Jun-03	12-Sep-03	06-Jul-04	18-Sep-04	01-Jun-05	12-Oct-05	14-Jun-06	02-Oct-06	06-Jun-07	24-Sep-07
1.0	-0.6	-6.40	4.23	6.28	6.86	6.10	6.91	1.79	0.77	-1.81	-1.25	5.59	-1.71	-0.16	-3.82	3.09	-2.26	1.03	-2.85
2.0	-1.6	-0.20	-0.27	7.58	6.76	5.98	6.57	0.09	5.98	0.79	6.71	7.84	5.95	-0.61	4.05	-0.62	4.75	-0.70	5.20
3.0	-2.6	0.00	-0.67	7.50	5.97	4.72	5.32	-1.01	4.38	-0.93	5.35	2.84	5.97	-0.94	4.76	-1.19	4.49	-1.24	4.49
4.0	-3.6	0.00		6.05	4.96	3.45	3.94	-0.51	3.10	-0.44	4.10	-0.34	5.21		5.19		4.32	-0.56	3.53
5.0	-4.6	-0.10	0.34	4.50	3.77	2.02	2.30	-0.98	1.03	-1.14	1.81	-1.22	3.00	-0.95	4.16	-1.45	2.14	-0.56	0.97
6.0	-5.6	-0.10																	
7.0	-6.6	-0.30	0.56	2.08	1.85	0.71	0.61	-0.39	-0.06	-0.53	0.32	-0.59	1.35	-0.14	2.29	-0.56	1.03	-0.74	-0.06
8.0	-7.6	-0.40	1.22	-0.10	1.83	1.02	0.93	0.57	0.54	0.41	0.75	0.37	1.49	0.91	2.50	0.54	1.41	0.40	0.17
9.0	-8.6	-0.35																	
10.0	-9.6	-0.10	1.89	1.37	1.58	1.45	1.41	1.32	1.02	1.12	1.02	1.08	1.19	1.66	2.04	1.30	1.34	1.24	0.33

*Tips at 5.6 m and 8.6 depth are suspect

DIVERSION CANAL DIKE
Geothermal Monitoring
CD-26



Diversion Canal Dike
Geothermal Monitoring
Long Term Monitoring for Nodes in CD-26



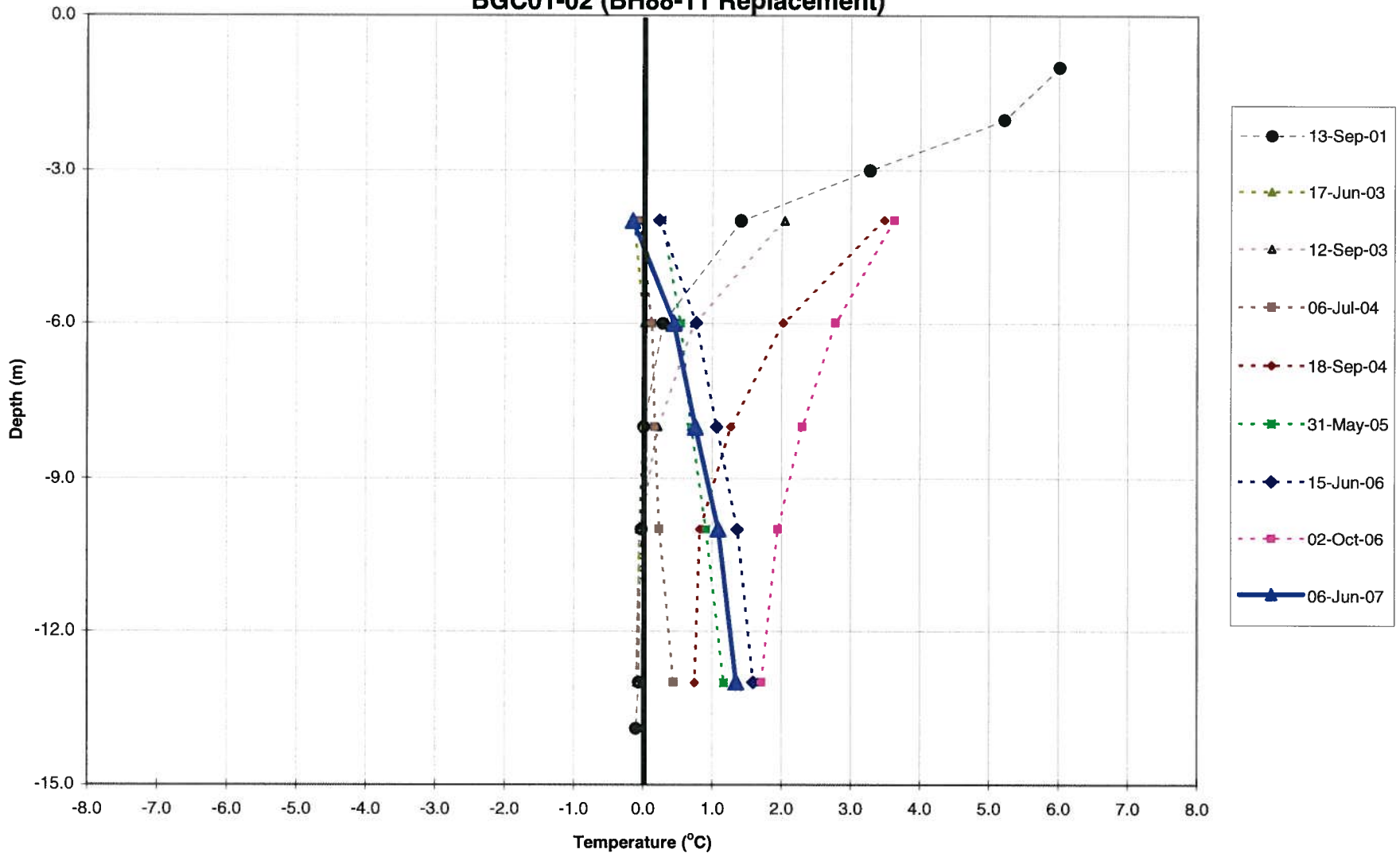
BGC01-02		Location:	Canal Dyke St.2+160			Elevation (m amsl):	1052.76	Coordinates:	1478.8mN 456.6mE	8V580652 6913530
		Thermistor String #	Date Installed:	2001	Thermistor Type:	YSI 44007	Ice-Bath Calibration:	yes	Surface Protector:	yes
Depth Correction:	0									

Depth on String	Actual Depth	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)
(m)	(m)	05-Sep-01	06-Sep-01	13-Sep-01	02-Apr-02	05-Apr-02	09-Apr-02	12-Apr-02	13-Jun-02	12-Sep-02	17-Jun-03	12-Sep-03	06-Jul-04	18-Sep-04	31-May-05	15-Jun-06	02-Oct-06	06-Jun-07	24-Sep-07
1.0	-1.0	10.86	11.05	12.05	20.50														
2.0	-2.0	11.82	11.97	12.53															
3.0	-3.0	13.25	13.53	13.83															
4.0	-4.0	15.31	15.40	15.19	16.34	16.33	16.33	16.34	16.36	14.76	16.44	14.72	16.36	13.69	16.10	16.13	13.59	16.45	27.96
6.0	-6.0	15.82	16.04	16.09	16.31	16.30	16.30	16.31	16.31	15.80	16.31	15.72	16.22	14.73	15.88	15.70	14.18	15.96	
8.0	-8.0	16.32	16.32	16.33	16.35	16.34	16.35	16.35	16.35	16.29	16.34	16.16	16.20	15.32	15.77	15.48	14.54	15.72	
10.0	-10.0	16.32	16.33	16.35	16.39	16.38	16.38	16.39	16.39	16.39	16.37	16.37	16.14	15.66	15.59	15.24	14.79	15.45	
13.0	-13.0	16.32	16.32	16.34	16.40	16.39	16.39	16.39		16.39	16.36	16.36	15.93	15.68	15.35	15.02	14.93	15.21	
13.9	-13.9	16.35	16.35	16.38															
		15.37	15.42	15.43			20.90												

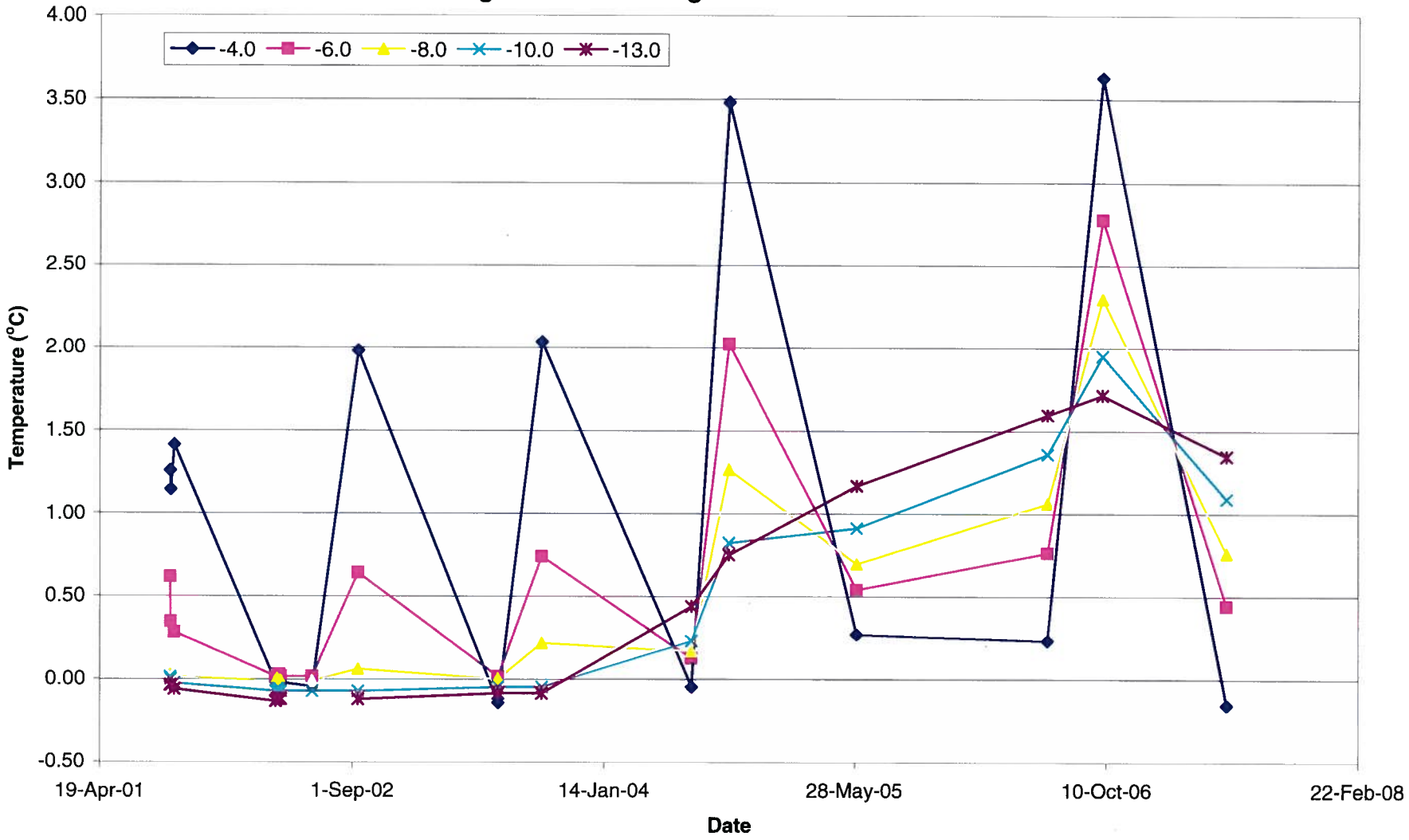
Depth on String	Actual Depth	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)
(m)	(m)	05-Sep-01	06-Sep-01	13-Sep-01	02-Apr-02	05-Apr-02	09-Apr-02	12-Apr-02	13-Jun-02	12-Sep-02	17-Jun-03	12-Sep-03	06-Jul-04	18-Sep-04	31-May-05	15-Jun-06	02-Oct-06	06-Jun-07	24-Sep-07
1.0	-1.0	8.13	7.77	6.01	-4.44														
2.0	-2.0	6.40	6.14	5.22															
3.0	-3.0	4.13	3.71	3.28															
4.0	-4.0	1.26	1.14	1.41	-0.02	-0.01	-0.01	-0.02	-0.04	1.98	-0.14	2.04	-0.04	3.48	0.27	0.23	3.63	-0.15	-10.19
6.0	-6.0	0.61	0.34	0.28	0.02	0.03	0.03	0.02	0.02	0.64	0.02	0.74	0.12	2.02	0.54	0.76	2.78	0.44	
8.0	-8.0	0.02	0.02	0.01	-0.01	0.00	-0.01	-0.01	-0.01	0.06	0.00	0.22	0.17	1.27	0.70	1.06	2.30	0.76	
10.0	-10.0	0.01	0.00	-0.02	-0.07	-0.06	-0.06	-0.07	-0.07	-0.07	-0.05	-0.05	0.23	0.82	0.91	1.36	1.95	1.09	
13.0	-13.0	-0.04	-0.04	-0.06	-0.13	-0.12	-0.12	-0.12		-0.12	-0.08	-0.08	0.44	0.75	1.17	1.60	1.71	1.35	
13.9	-13.9	-0.06	-0.06	-0.10															

The node is mulfunctioning. Numbers are not included in the graphs.

DIVERSION CANAL DIKE
Geothermal Monitoring
BGC01-02 (BH88-11 Replacement)

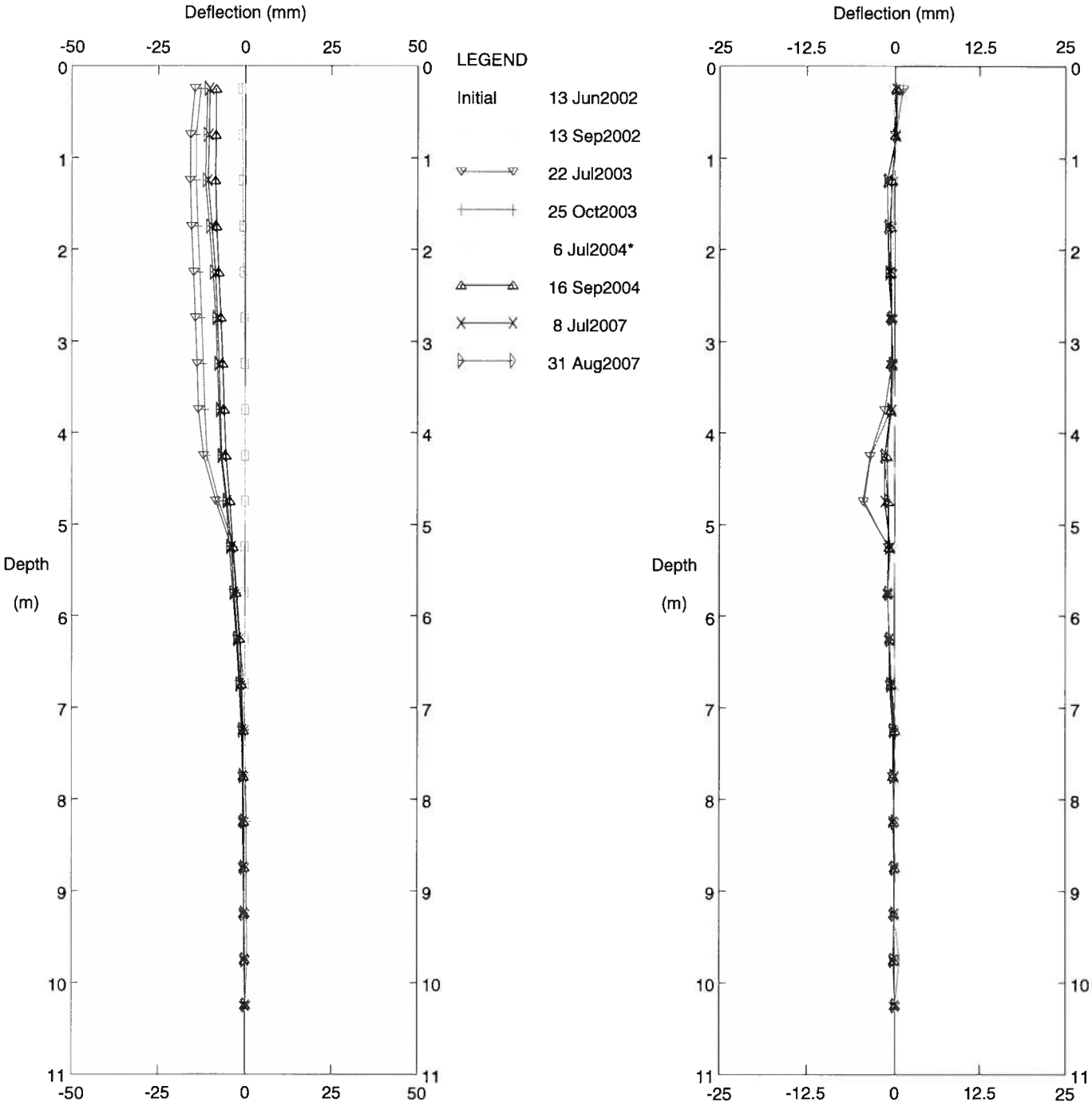


Diversion Canal Dike
Geothermal Monitoring
Long Term Monitoring for Nodes in BGC01-02



SLOPE INDICATORS

BGC Engineering Inc. - Calgary, AB



Cumulative Deflection

Direction A

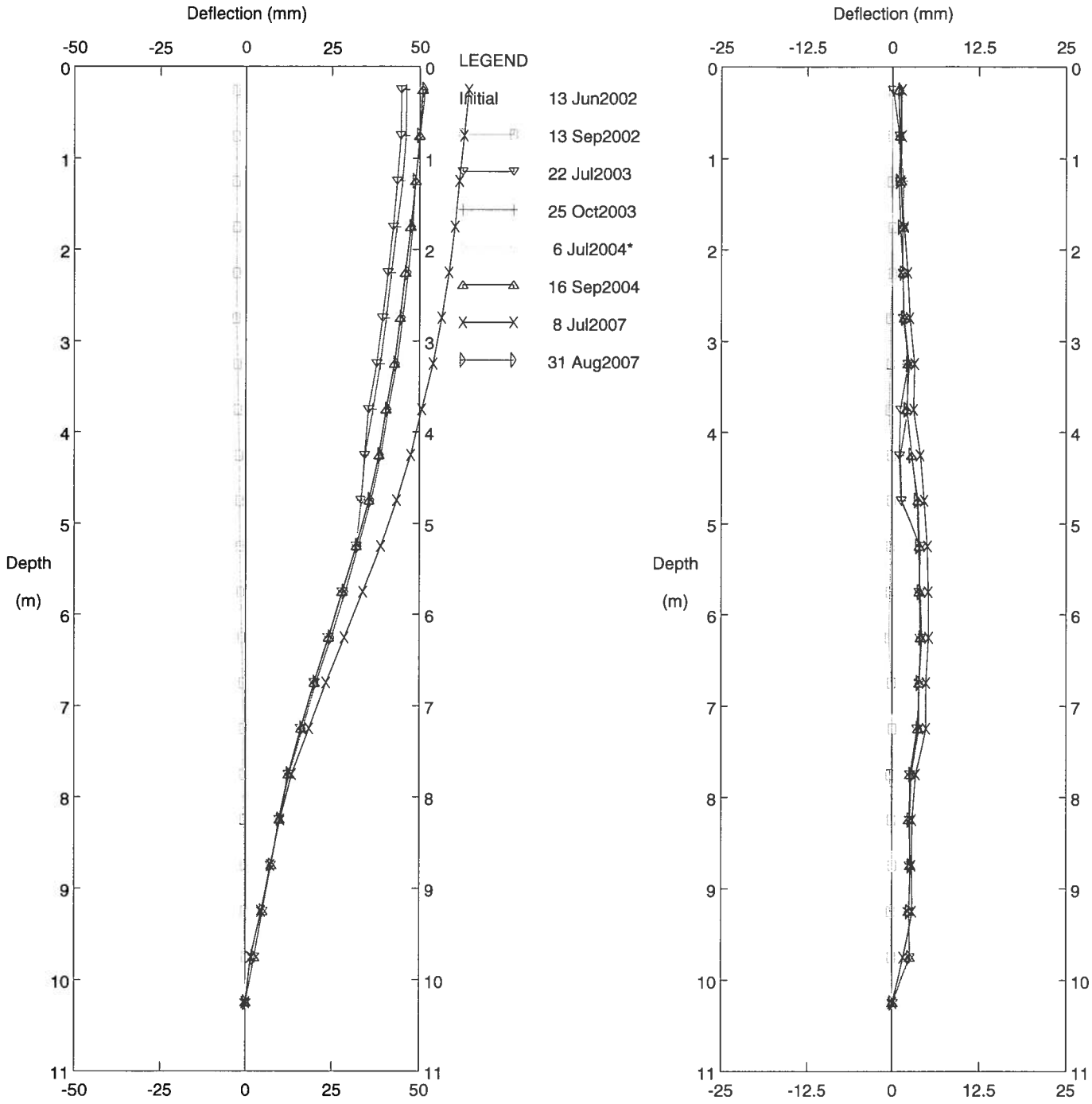
Incremental Deflection

Direction A

CD-10, Inclinometer 0+990

Sets marked * include zero shift and/or rotation corrections.

BGC Engineering Inc. - Calgary, AB



Cumulative Deflection

Direction B

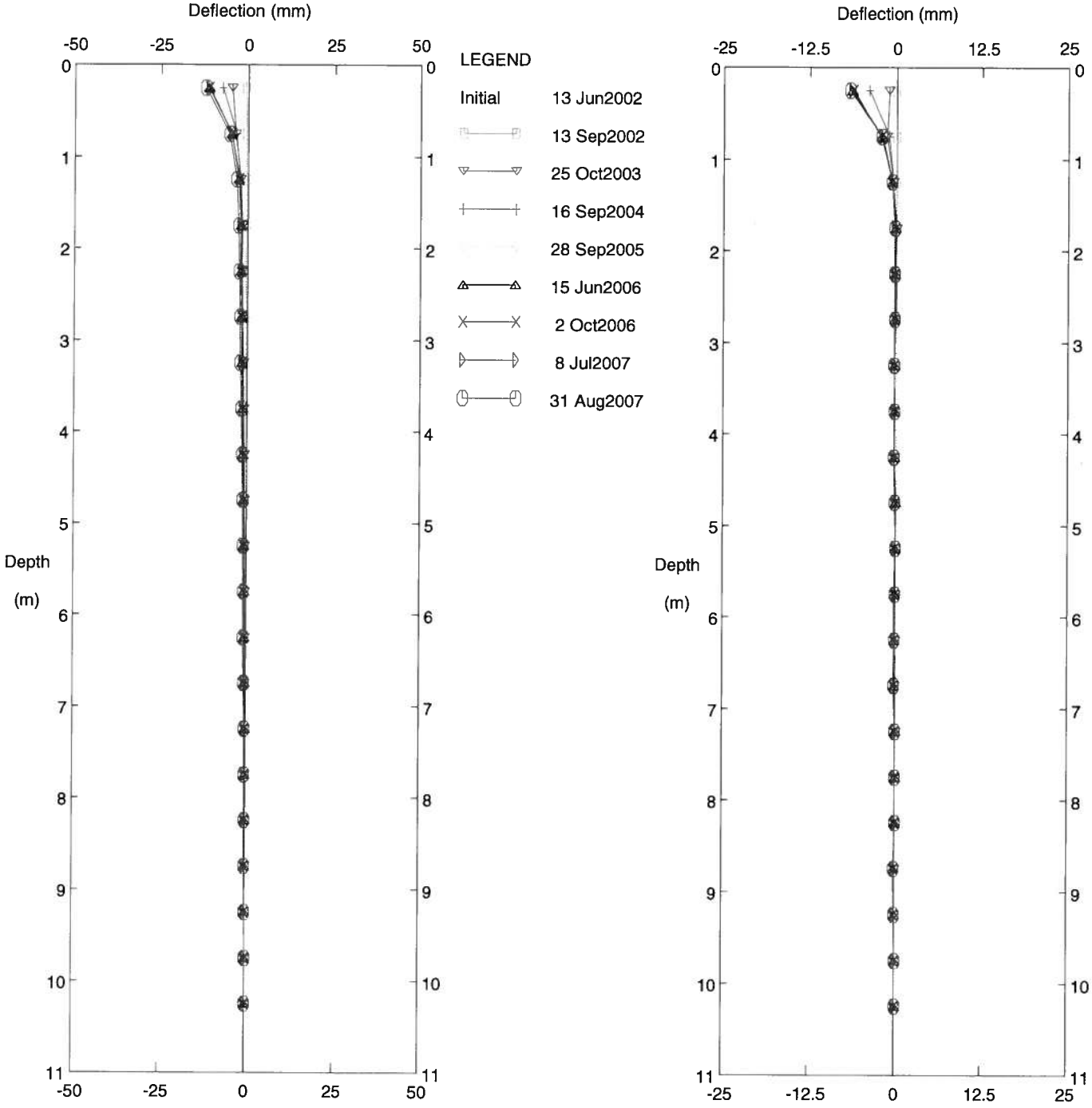
Incremental Deflection

Direction B

CD-10, Inclinometer 0+990

Sets marked * include zero shift and/or rotation corrections.

BGC Engineering Inc. - Calgary, AB



Cumulative Deflection

Direction A

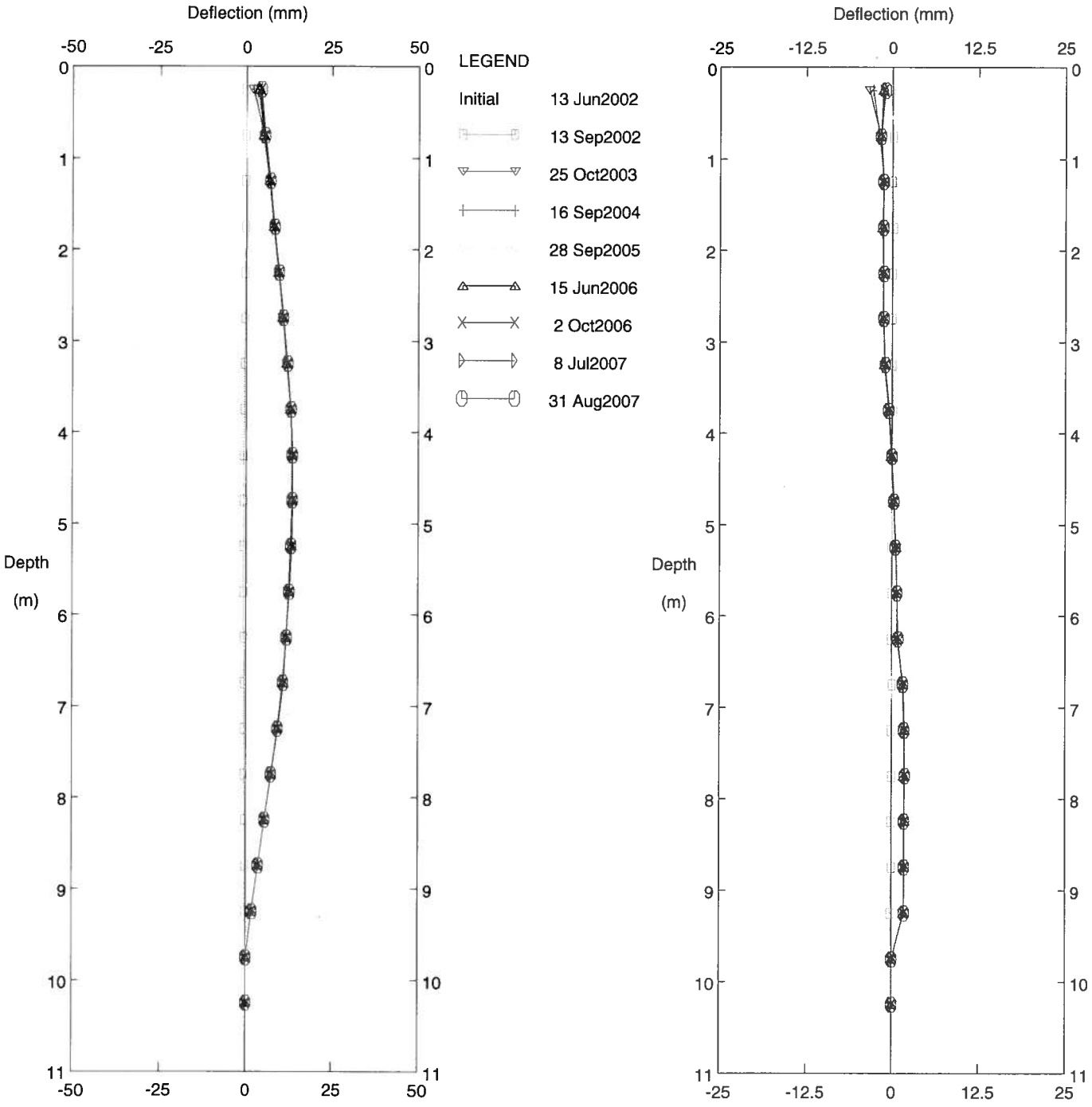
Incremental Deflection

Direction A

CD-15, Inclinometer 1+530

Sets marked * include zero shift and/or rotation corrections.

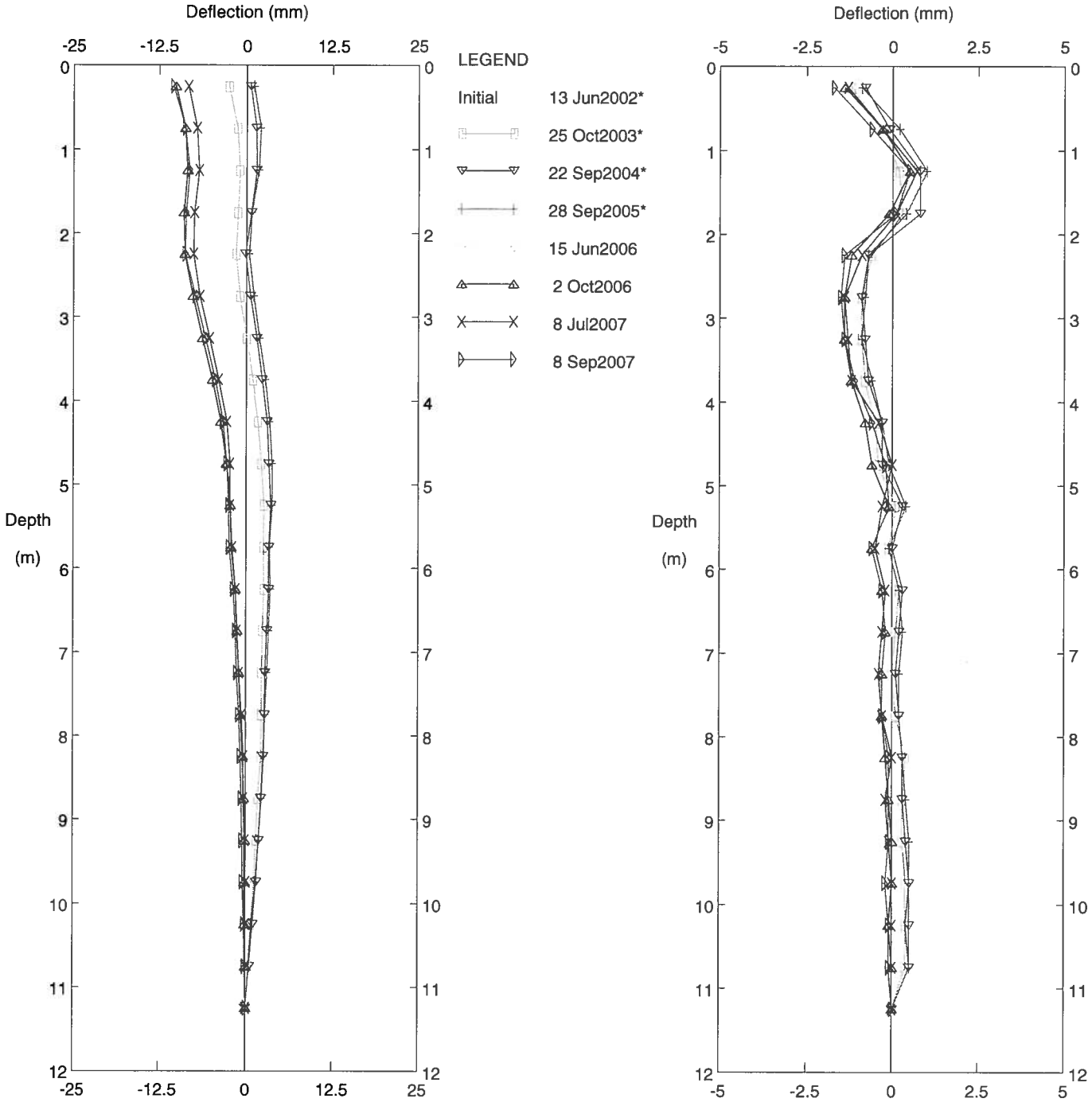
BGC Engineering Inc. - Calgary, AB



CD-15, Inclinometer 1+530

Sets marked * include zero shift and/or rotation corrections.

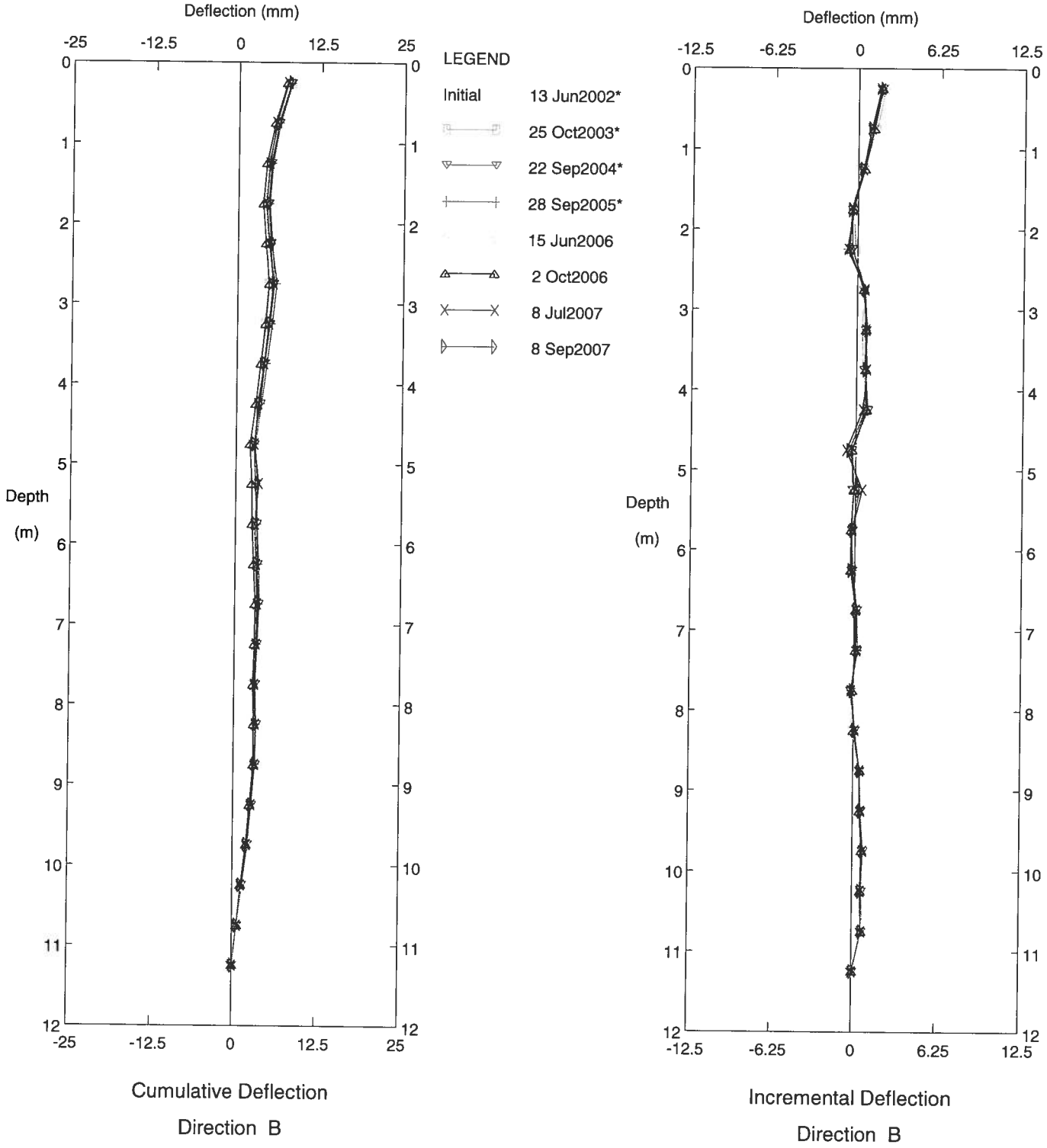
BGC Engineering Inc. - Calgary, AB



91CD-1, Inclinometer 1+767

Sets marked * include zero shift and/or rotation corrections.

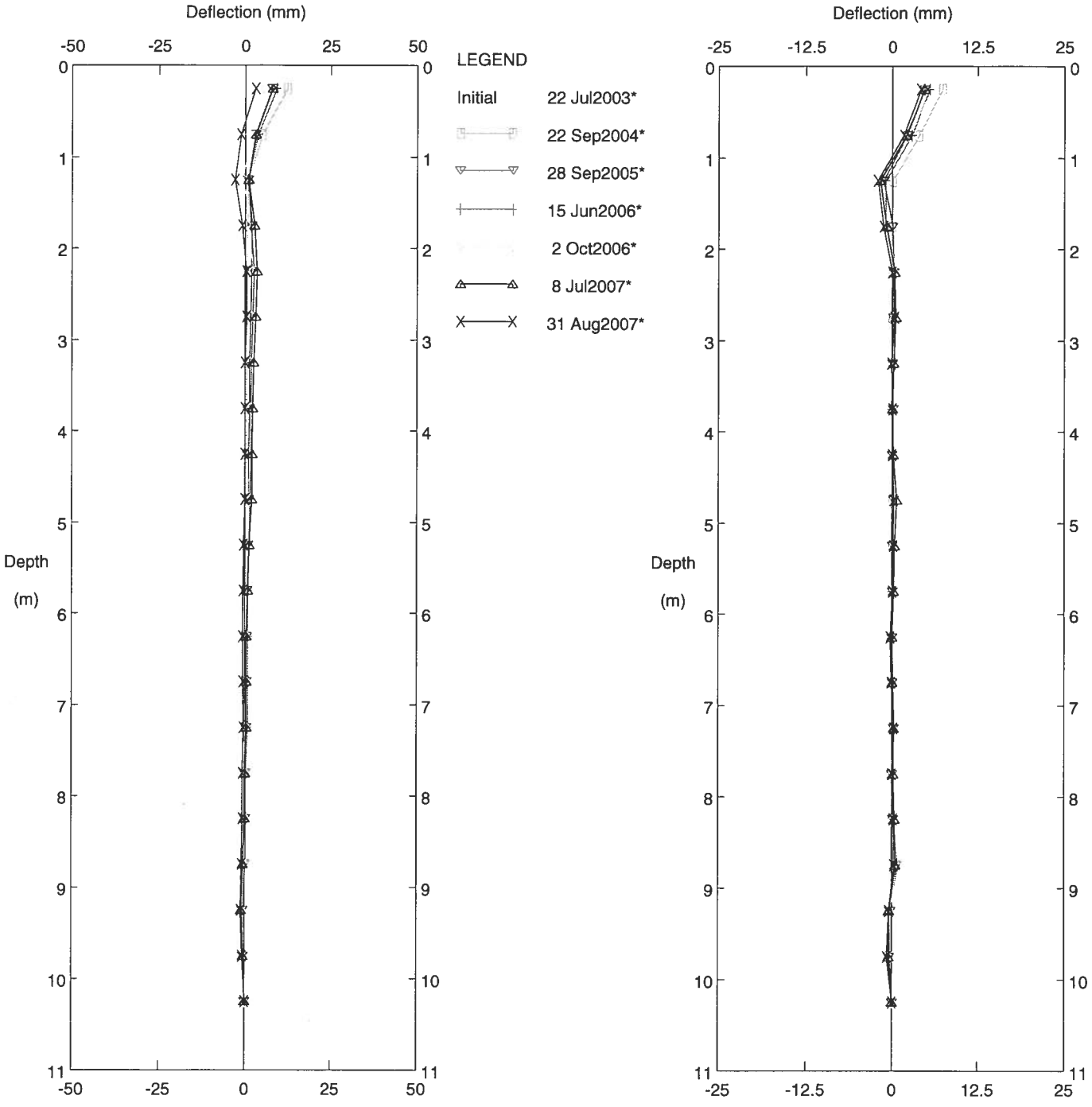
BGC Engineering Inc. - Calgary, AB



91CD-1, Inclinometer 1+767

Sets marked * include zero shift and/or rotation corrections.

BGC Engineering Inc. - Calgary, AB



Cumulative Deflection

Direction A

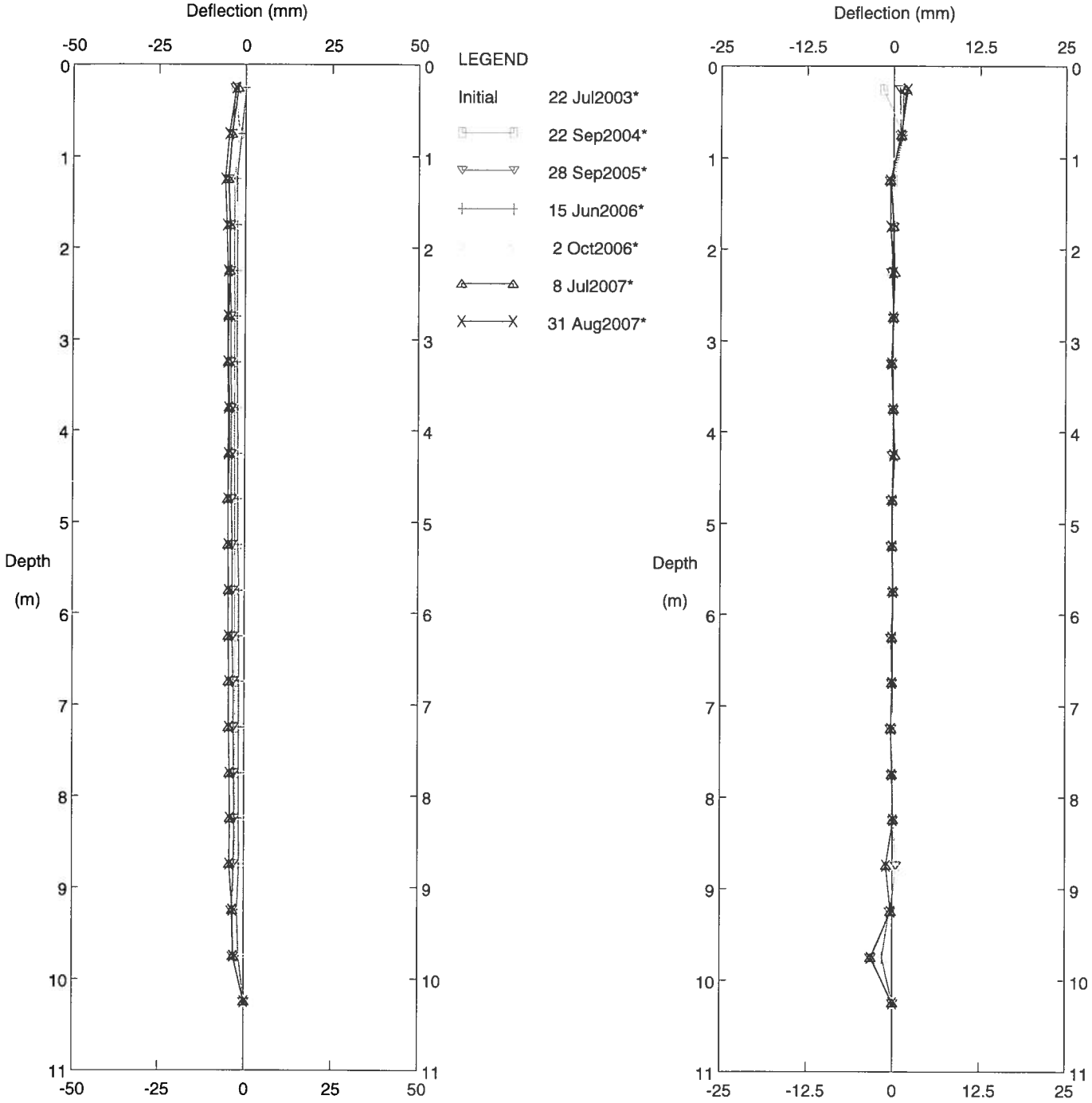
Incremental Deflection

Direction A

CD-19, Inclinometer 1+900

Sets marked * include zero shift and/or rotation corrections.

BGC Engineering Inc. - Calgary, AB



Cumulative Deflection

Direction B

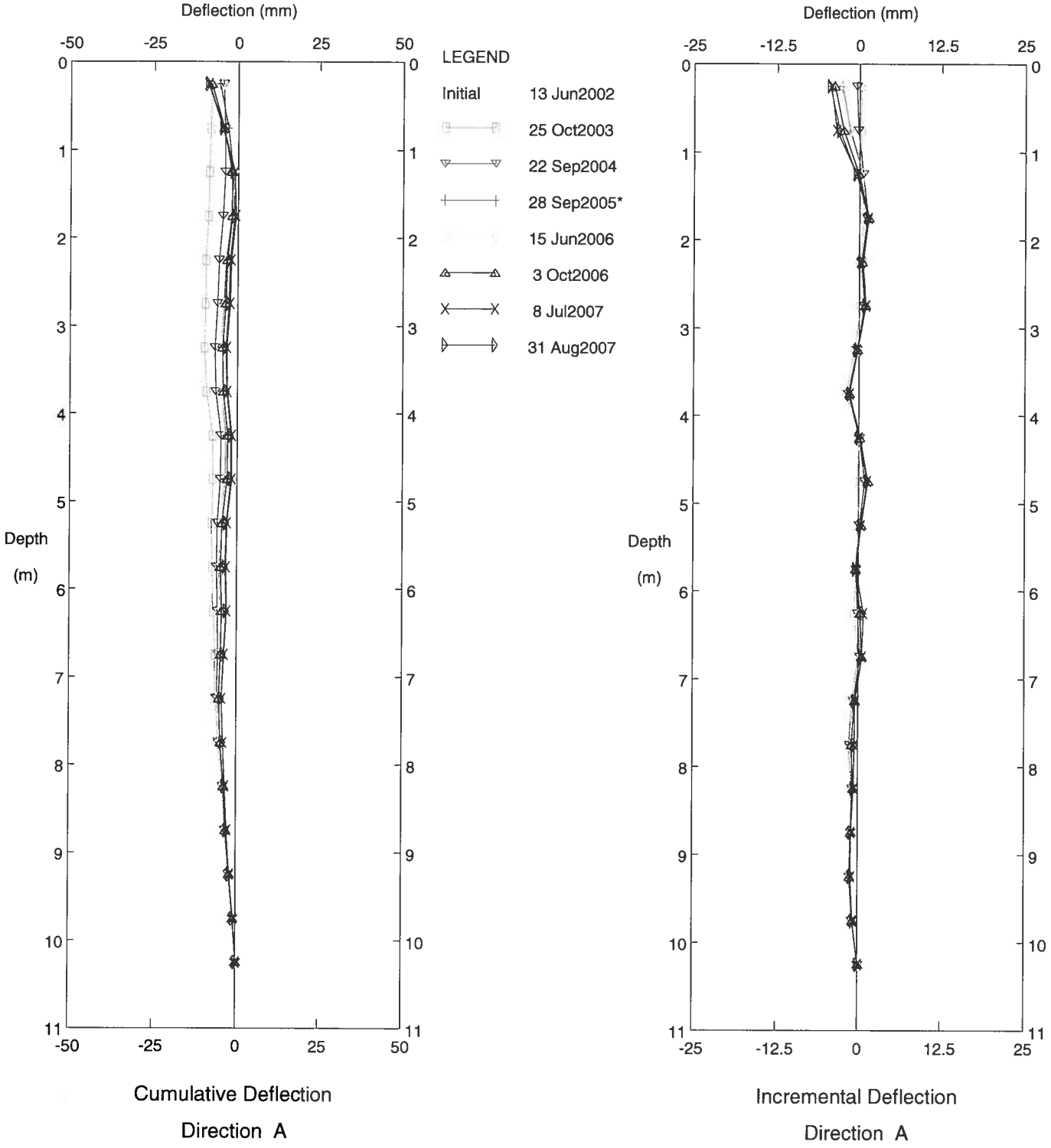
Incremental Deflection

Direction B

CD-19, Inclinometer 1+900

Sets marked * include zero shift and/or rotation corrections.

BGC Engineering Inc. - Calgary, AB



Cumulative Deflection

Direction A

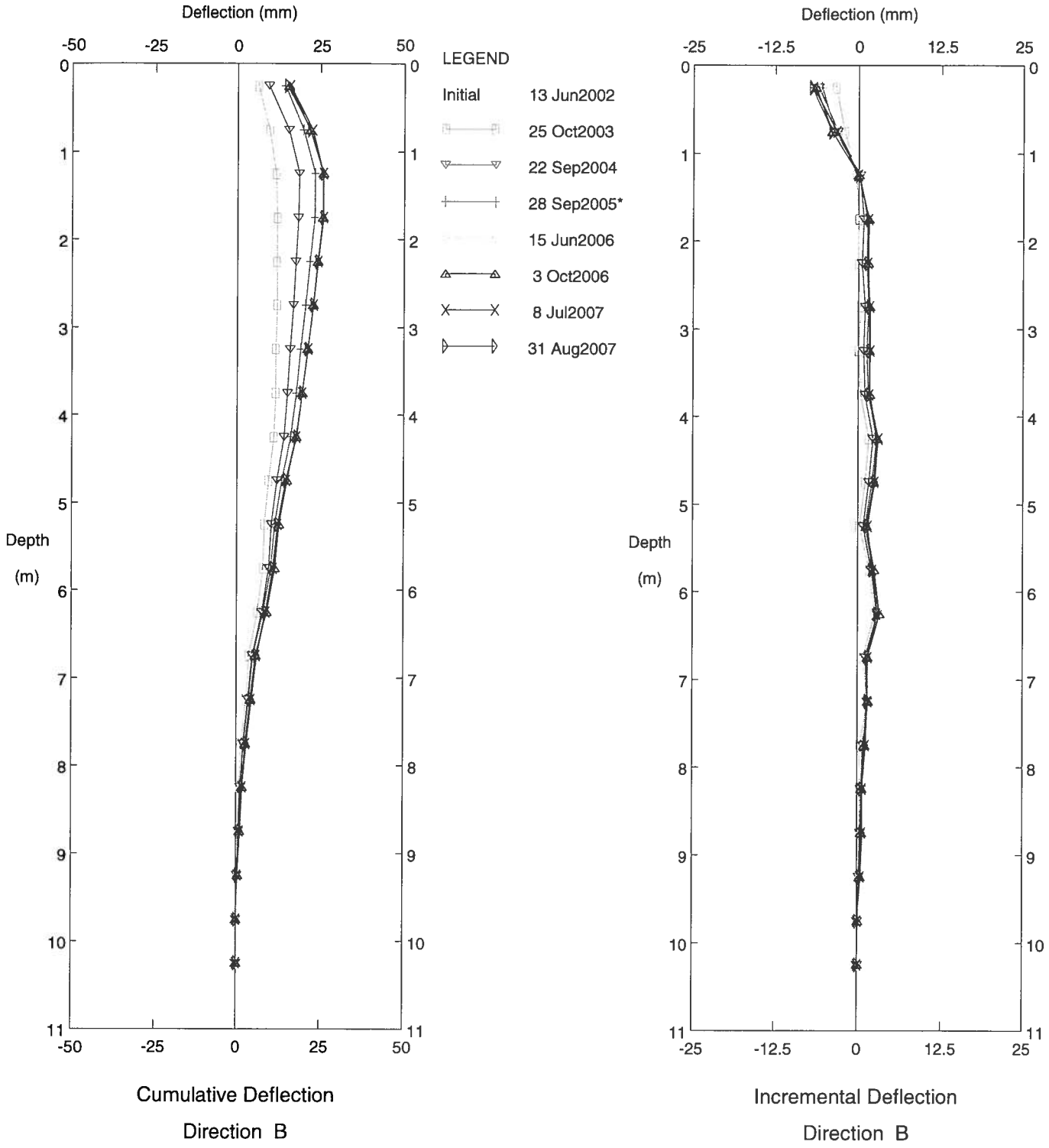
Incremental Deflection

Direction A

CD-21, Inclinometer 2+100

Sets marked * include zero shift and/or rotation corrections.

BGC Engineering Inc. - Calgary, AB



Cumulative Deflection

Direction B

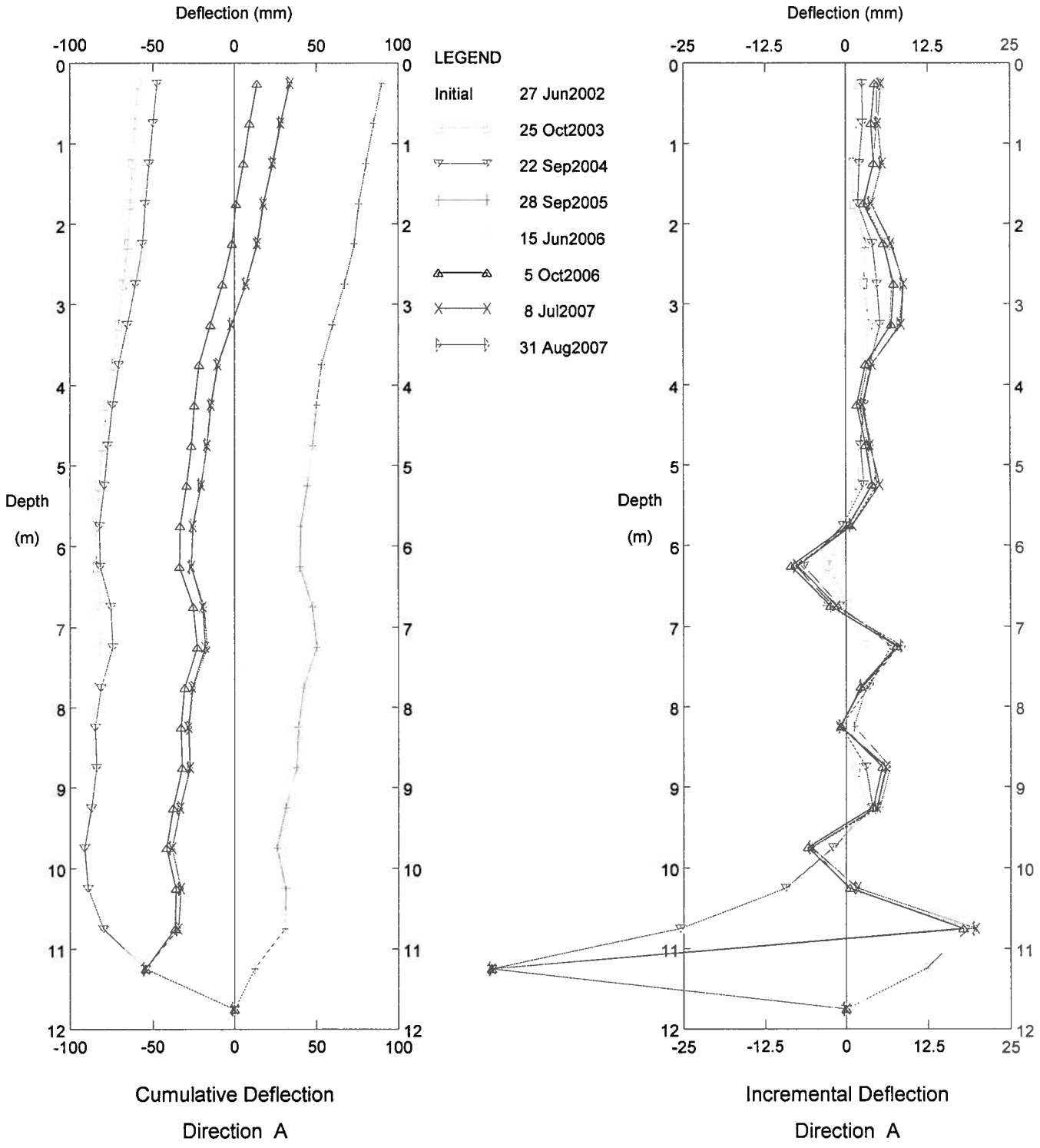
Incremental Deflection

Direction B

CD-21, Inclinometer 2+100

Sets marked * include zero shift and/or rotation corrections.

BGC Engineering Inc. - Calgary, AB



Cumulative Deflection

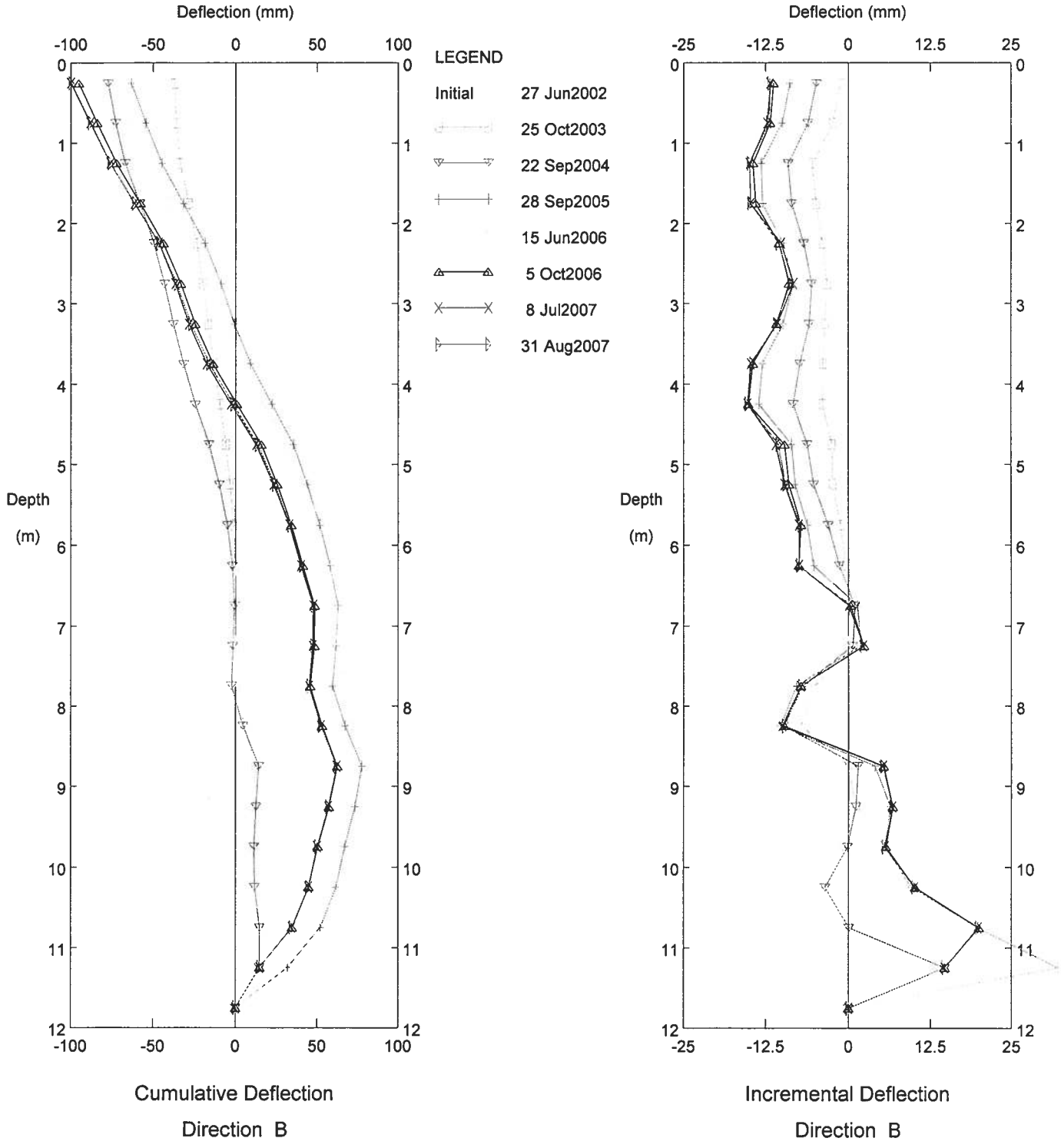
Direction A

Incremental Deflection

Direction A

BGC01-01, Inclinometer BGC01-01

BGC Engineering Inc. - Calgary, AB



Cumulative Deflection

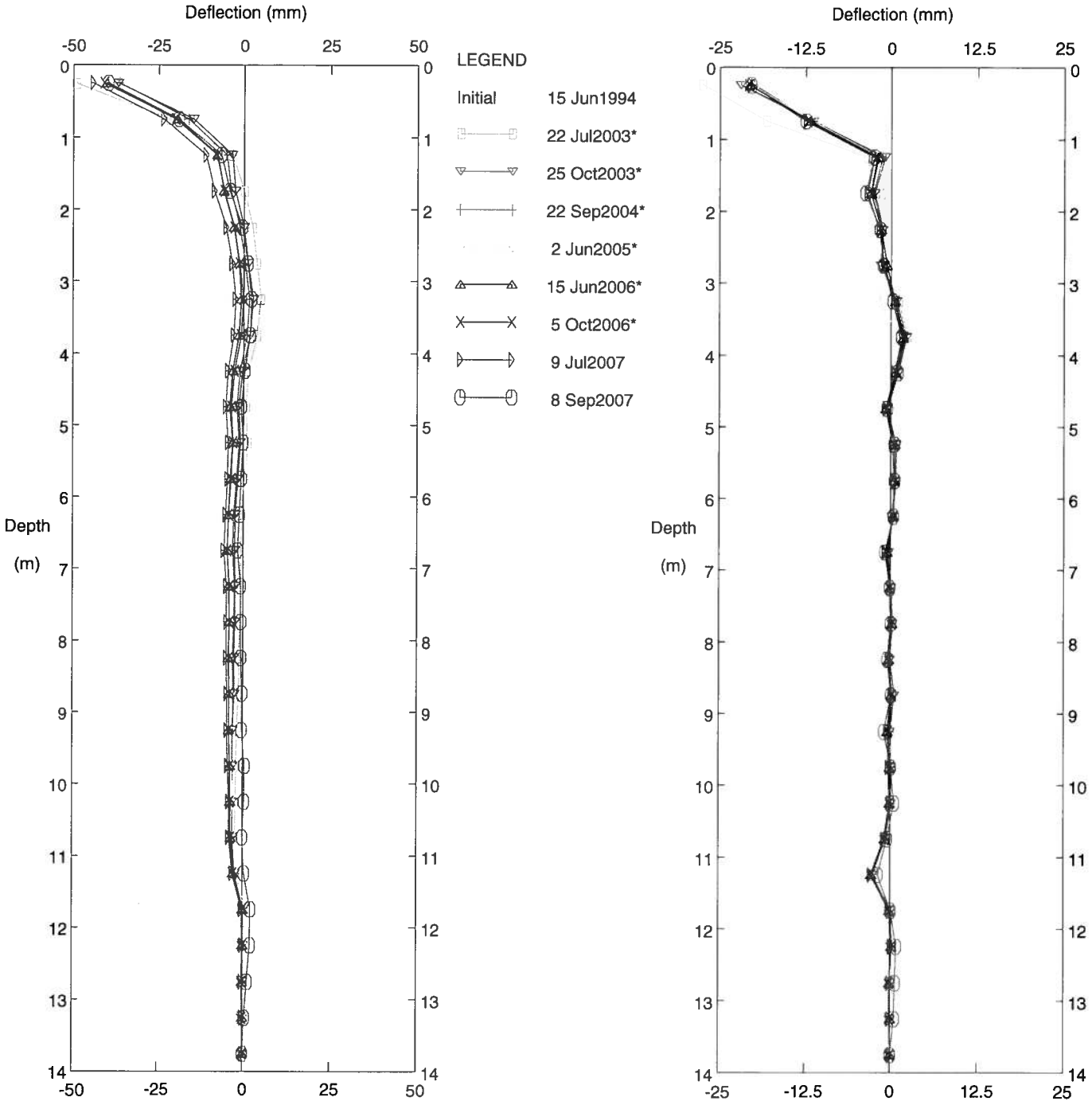
Direction B

Incremental Deflection

Direction B

BGC01-01, Inclinometer BGC01-01

BGC Engineering Inc. - Calgary, AB



Cumulative Deflection

Direction A

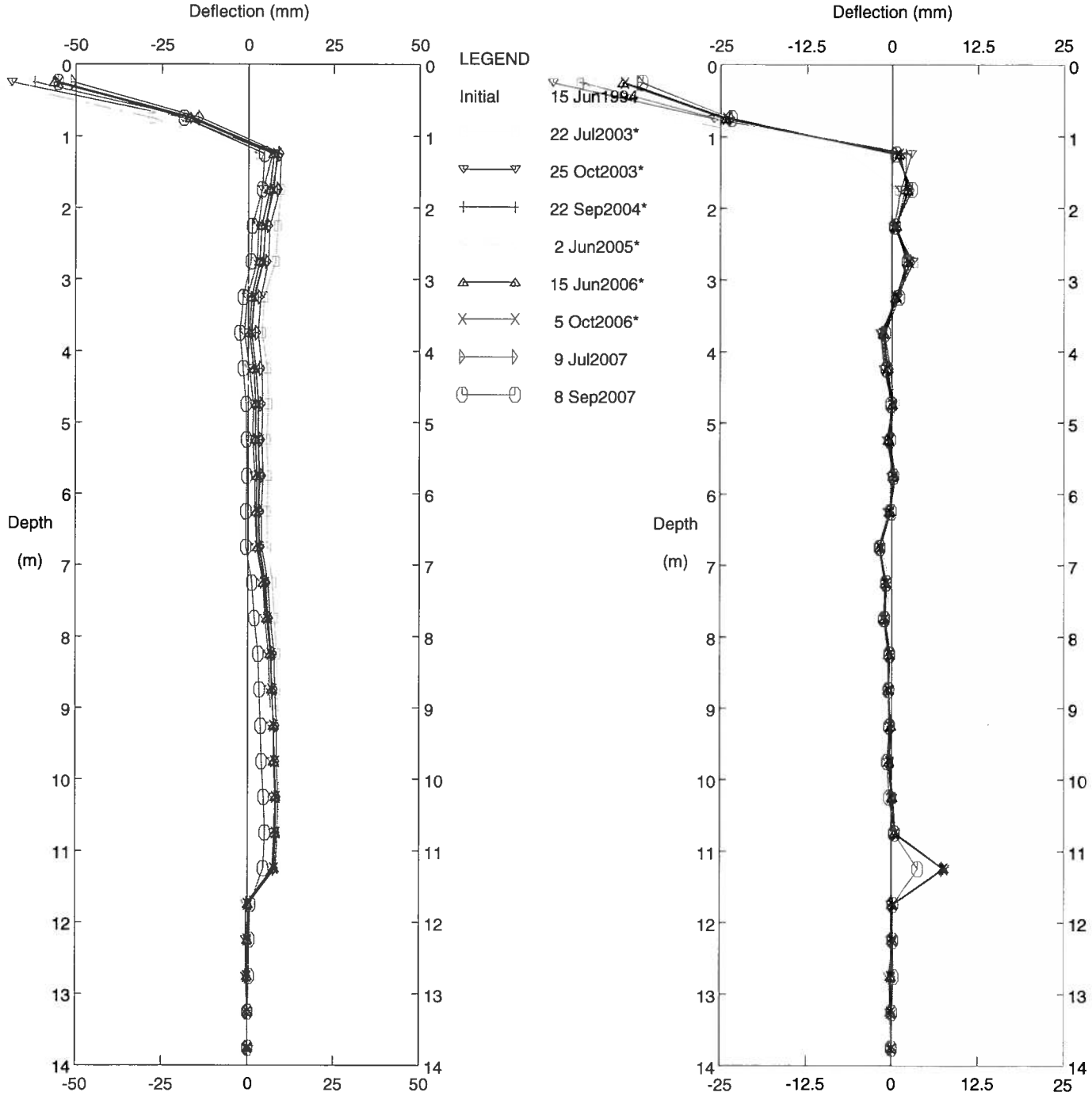
Incremental Deflection

Direction A

94CD-1, Inclinometer BH-94CD-1

Sets marked * include zero shift and/or rotation corrections.

BGC Engineering Inc. - Calgary, AB



Cumulative Deflection

Direction B

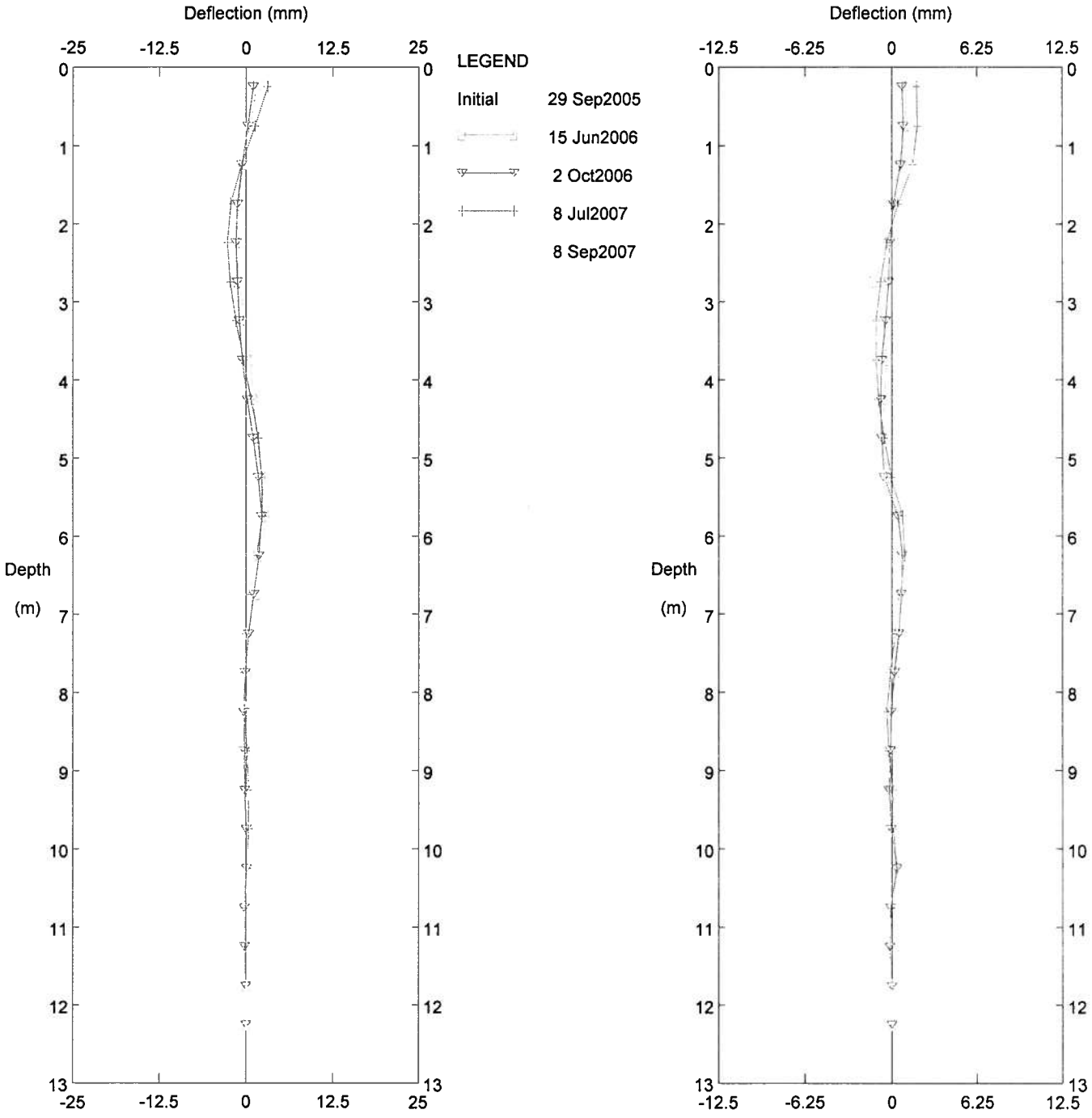
Incremental Deflection

Direction B

94CD-1, Inclinometer BH-94CD-1

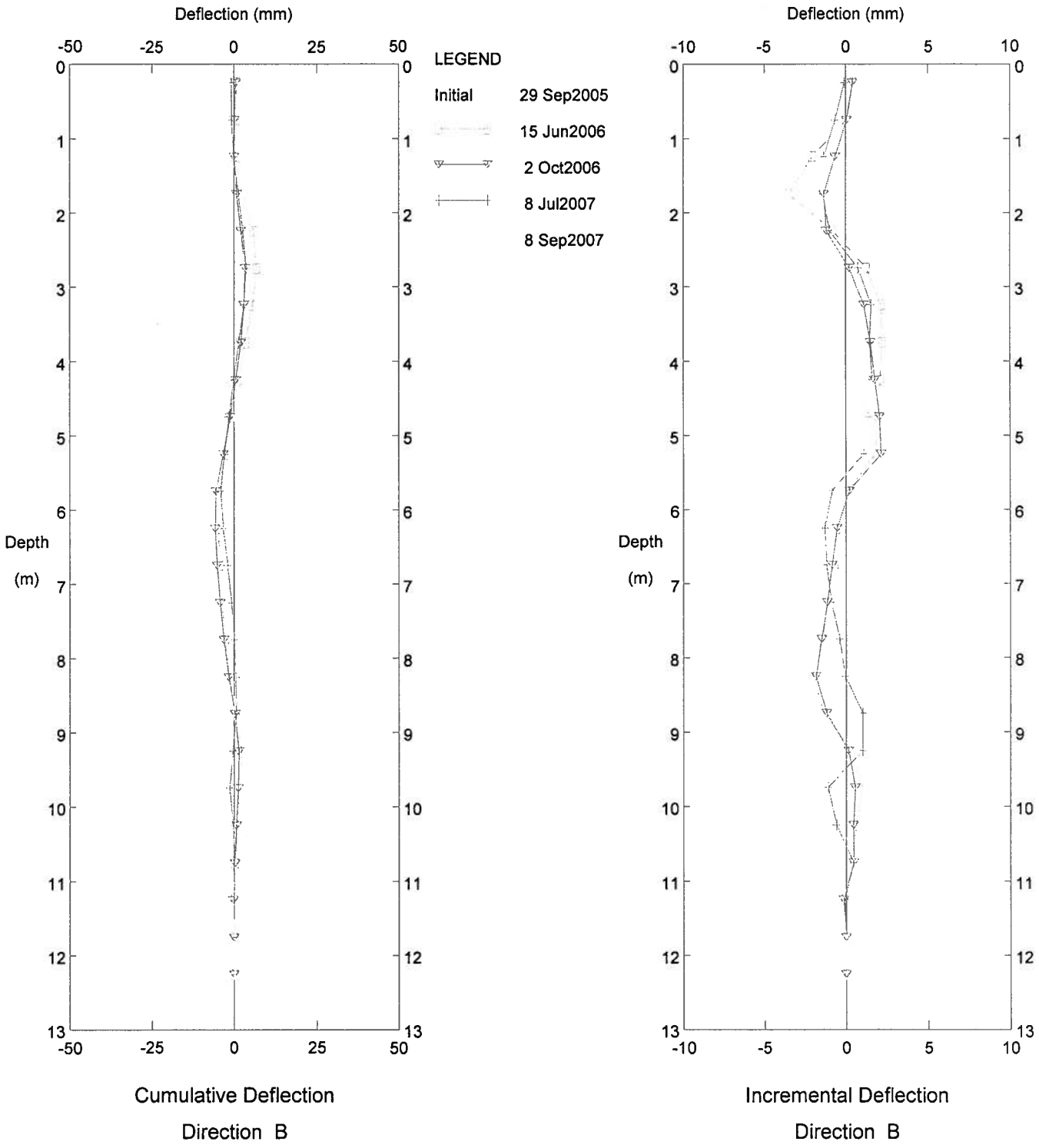
Sets marked * include zero shift and/or rotation corrections.

BGC Engineering Inc. - Calgary, AB



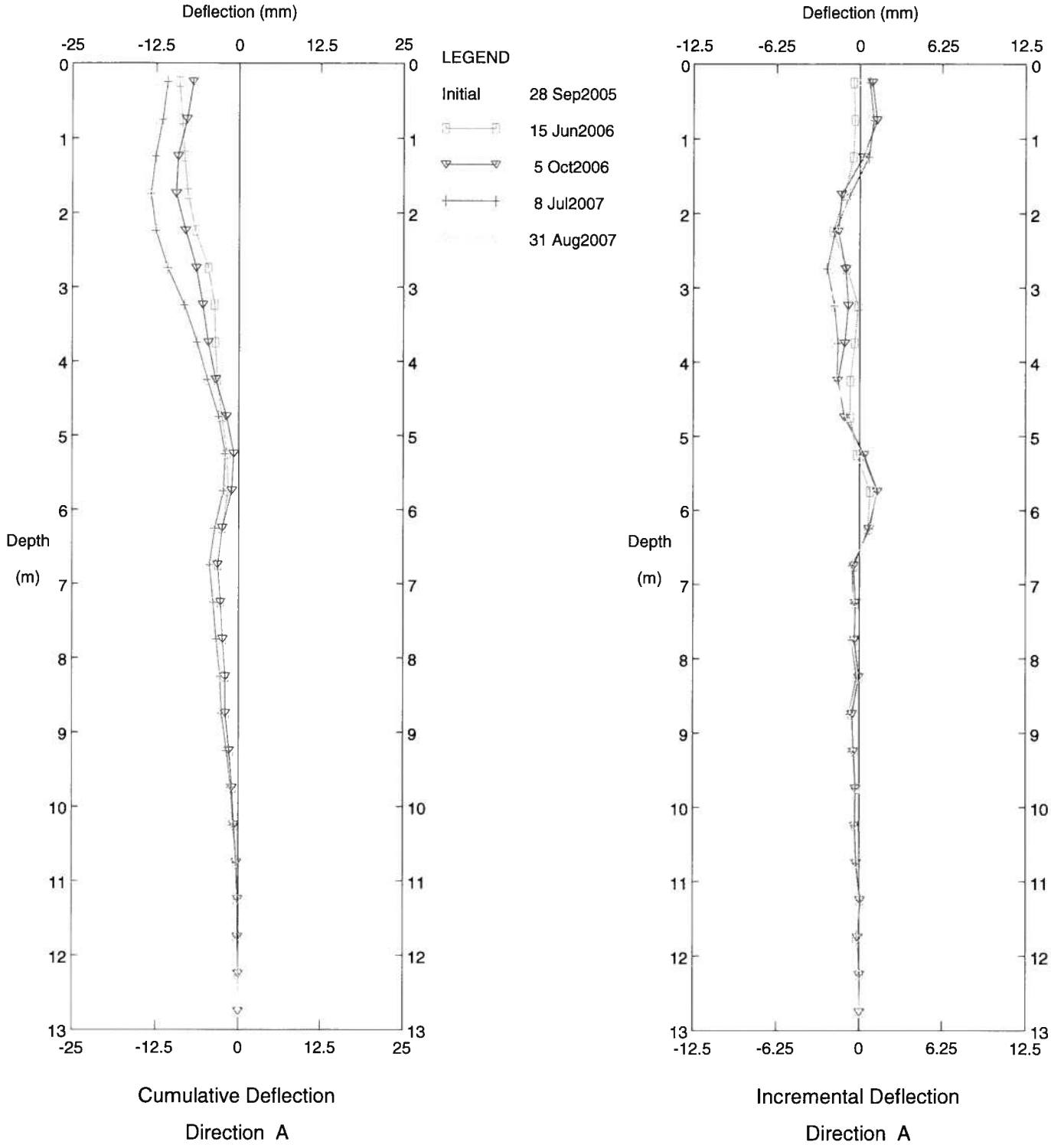
Canal Dike, Inclinometer BGC05-05

BGC Engineering Inc. - Calgary, AB



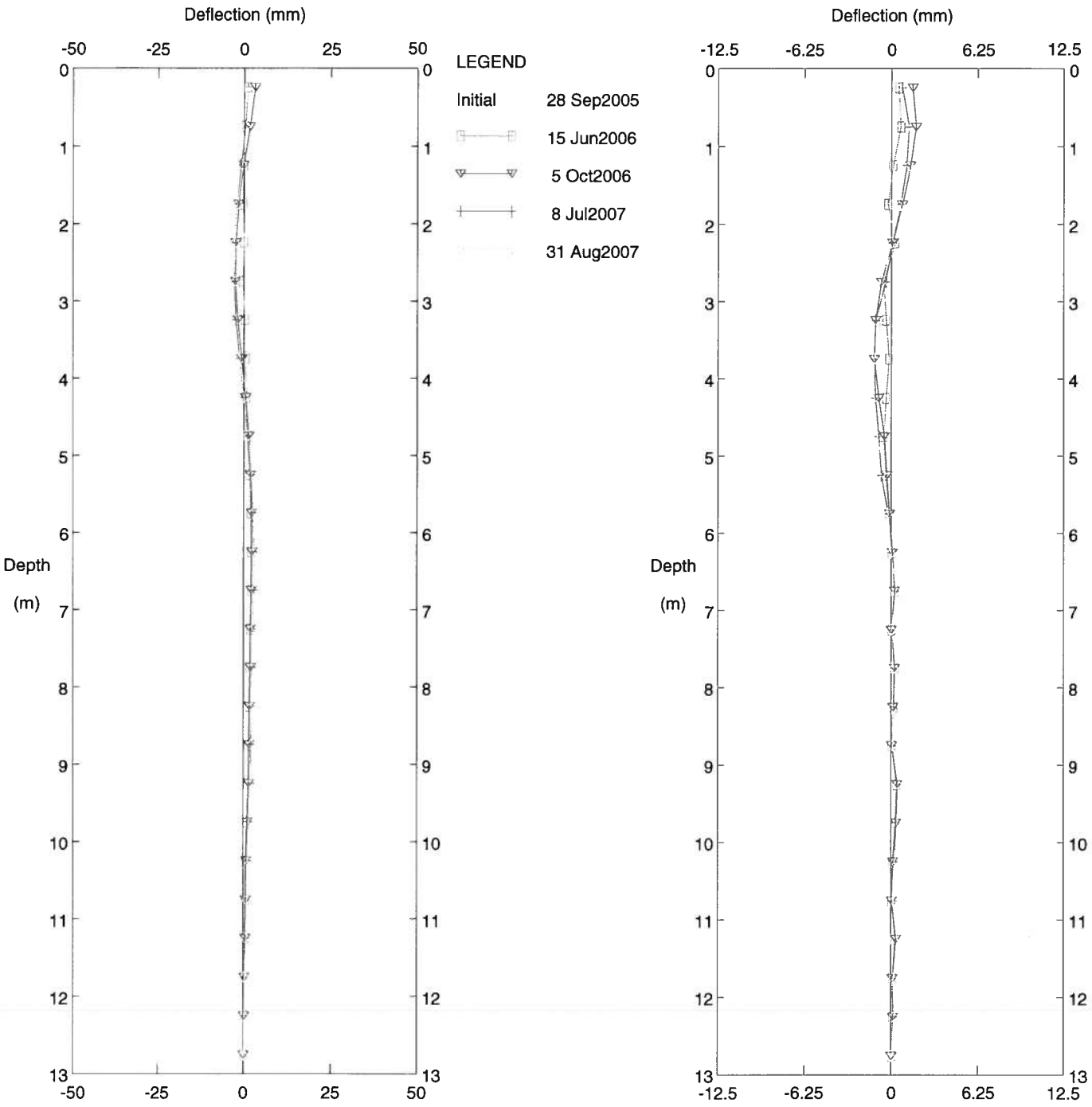
Canal Dike, Inclinometer BGC05-05

BGC Engineering Inc. - Calgary, AB



Canal Dike, Inclinometer BGC05-08

BGC Engineering Inc. - Calgary, AB



Cumulative Deflection

Direction B

Incremental Deflection

Direction B

Canal Dike, Inclinometer BGC05-08

DIVERSION CANAL
SPOIL PILES

THERMISTORS

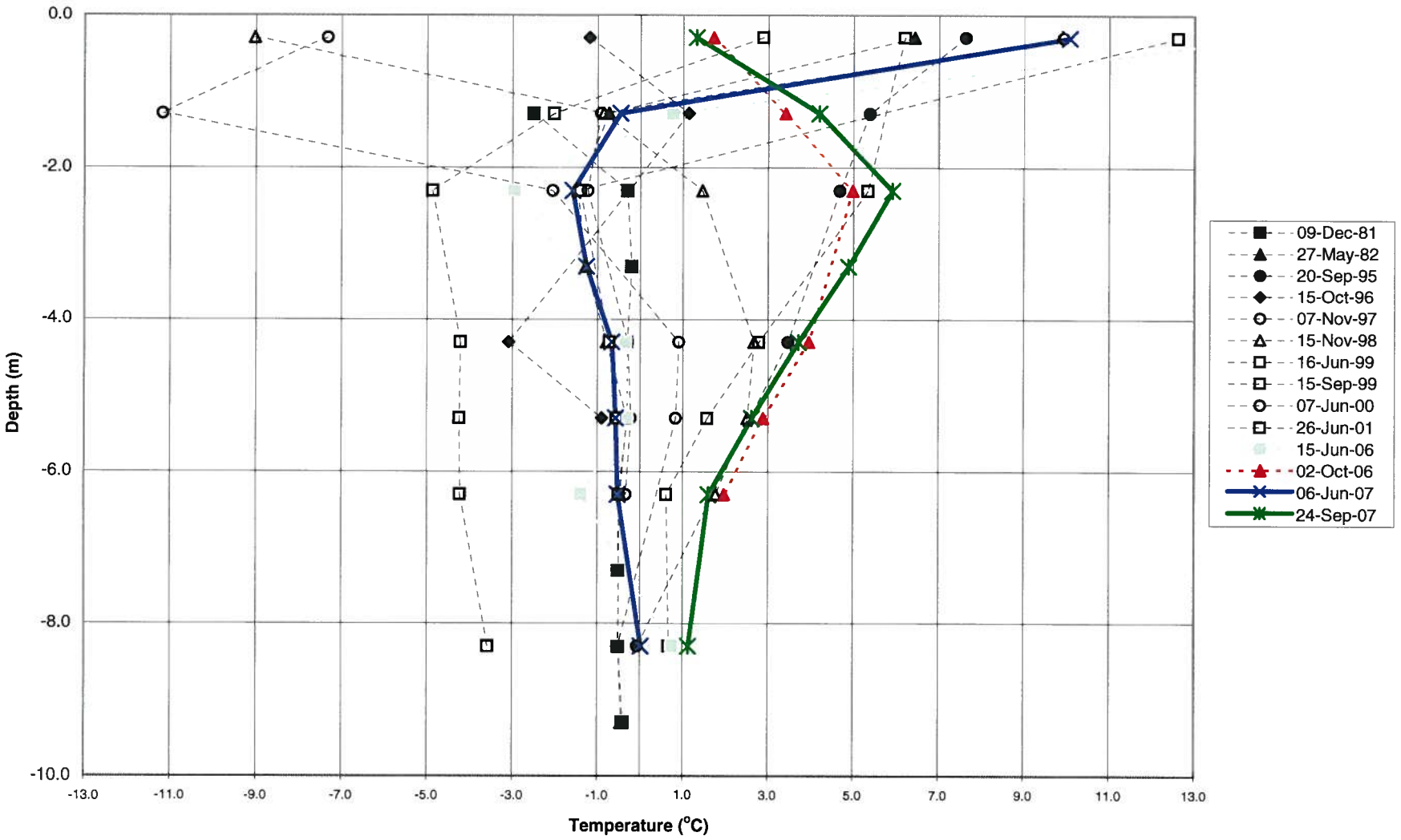
Faro Mine Instrumentation
Diversion Canal Spoil Pile

SP-2		Location:	N. of canal dyke St.1+530		Surface Elevation: (m advpd)	1093.1	Coordinates:	1274.1 mN & 1055.7 mE		
Thermistor String #21		Date Installed:	1981		Thermistor Type:	Cantec Controls YSI 44007	Ice-Bath Calibration:	applied	Surface Protector:	yes
Depth Correction	0.3									

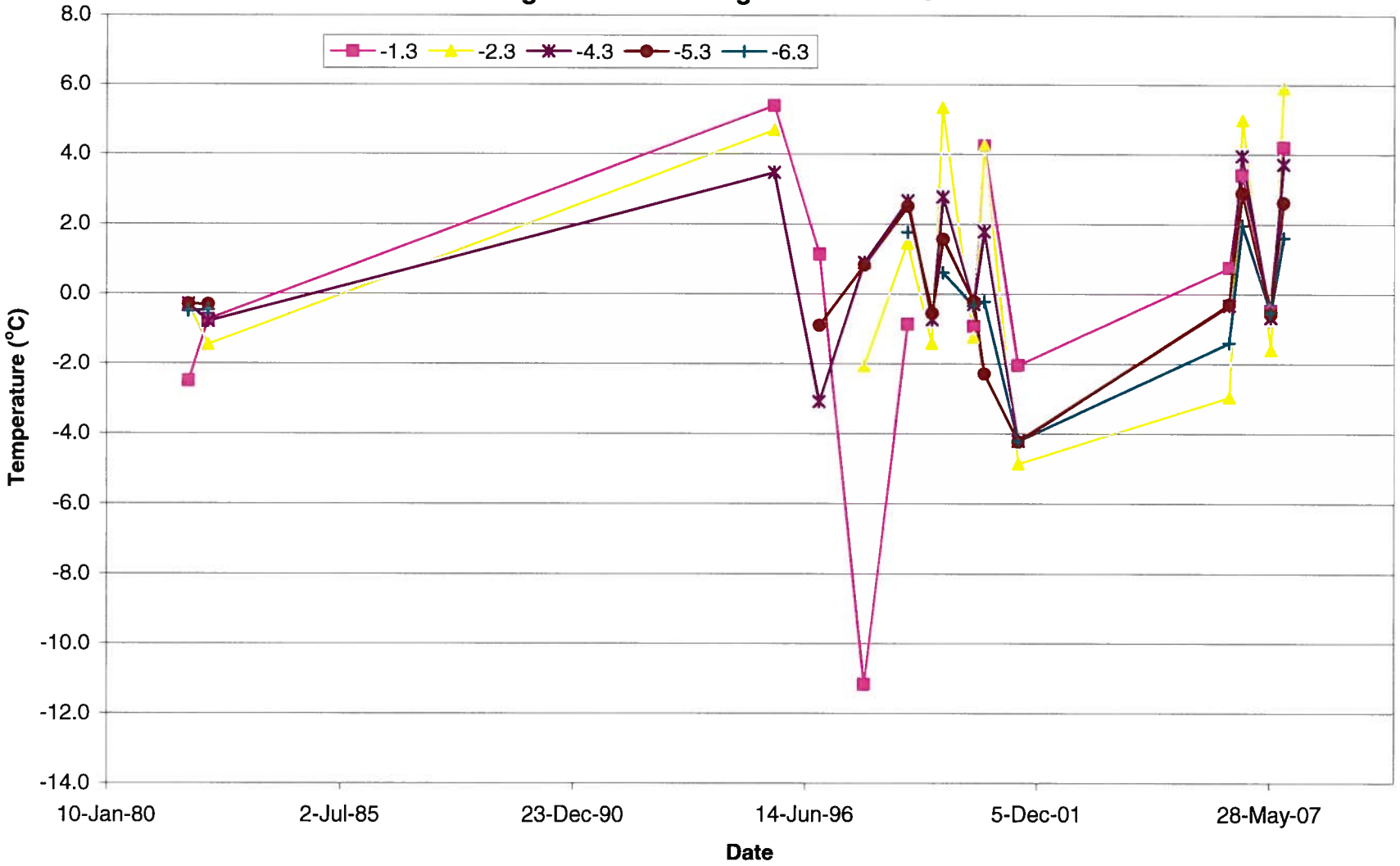
Depth on String	Actual Depth	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)
(m)	(m)	09-Dec-81	27-May-82	20-Sep-95	15-Oct-96	07-Nov-97	15-Nov-98	16-Jun-99	15-Sep-99	07-Jun-00	05-Sep-00	26-Jun-01	15-Jun-06	02-Oct-06	06-Jun-07	24-Sep-07
0.0	-0.3		11.74	11.07	17.22	23.75	26.03	8.71	11.87	9.90	13.19	14.00	7.89	14.85	9.83	15.15
1.0	-1.3	18.44	16.84	12.37	15.29	29.29	16.95			17.00	13.09	18.00	15.60	13.64	16.59	13.11
2.0	-2.3	16.45	17.46	12.80		18.00	15.04	17.41	12.39	17.25	13.08	20.85	18.86	12.61	17.57	12.04
3.0	-3.3	16.34	17.27						13.3				17.21	O/L	17.28	12.67
4.0	-4.3	16.45	16.87	13.60	18.99	15.47	14.15	16.81	14.07	16.44	14.79	20.14	16.47	13.27	16.76	13.43
5.0	-5.3	16.40	16.41		16.96	15.48	14.22	16.61	14.91	16.33	18.16	20.1	16.39	14	16.68	14.19
6.0	-6.3	16.60	16.57				14.79		15.68	16.46	16.36	20.13	17.38	14.66	16.64	14.93
7.0	-7.3	16.62	16.62										19.90	O/L	too niosy	too niosy
8.0	-8.3	16.62	16.62	16.25		16.63	14.85		15.65		16.07	19.48	15.60	to niosy	16.18	15.29
9.0	-9.3	16.50	16.53											85.1	86.4	85.7

Depth on String	Actual Depth	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)
(m)	(m)	09-Dec-81	27-May-82	20-Sep-95	15-Oct-96	07-Nov-97	15-Nov-98	16-Jun-99	15-Sep-99	07-Jun-00	05-Sep-00	26-Jun-01	15-Jun-06	02-Oct-06	06-Jun-07	24-Sep-07
0.0	-0.3		6.43	7.63	-1.19	-7.32	-9.03	12.61	6.20	9.93	4.07	2.88	14.70	1.71	10.08	1.32
1.0	-1.3	-2.50	-0.74	5.39	1.13	-11.17	-0.87			-0.92	4.25	-2.03	0.76	3.40	-0.47	4.20
2.0	-2.3	-0.30	-1.46	4.68		-2.05	1.46	-1.41	5.33	-1.23	4.24	-4.87	-2.95	4.98	-1.58	5.91
3.0	-3.3	-0.20	-1.28												-1.26	4.88
4.0	-4.3	-0.30	-0.79	3.46	-3.08	0.90	2.67	-0.72	2.78	-0.29	1.79	-4.21	-0.33	3.95	-0.67	3.71
5.0	-5.3	-0.30	-0.31		-0.90	0.83	2.51	-0.55	1.57	-0.22	-2.28	-4.23	-0.29	2.88	-0.57	2.61
6.0	-6.3	-0.50	-0.46				1.77		0.62	-0.33	-0.21	-4.22	-1.39	1.97	-0.53	1.60
7.0	-7.3	-0.50	-0.50													
8.0	-8.3	-0.50	-0.50	-0.06		-0.51			0.68		0.14	-3.57	0.74		0.02	1.13
9.0	-9.3	-0.40	-0.44													

THERMISTOR SP-2
(installed 1981)



Diversion Canal Spoil Pile
Geothermal Monitoring
Long Term Monitoring for Nodes in SP-2



SPtherm_updated_2007
SP-2 Depth chart

BGC Engineering Inc.

Faro Mine Instrumentation
Diversion Canal Spoil Pile

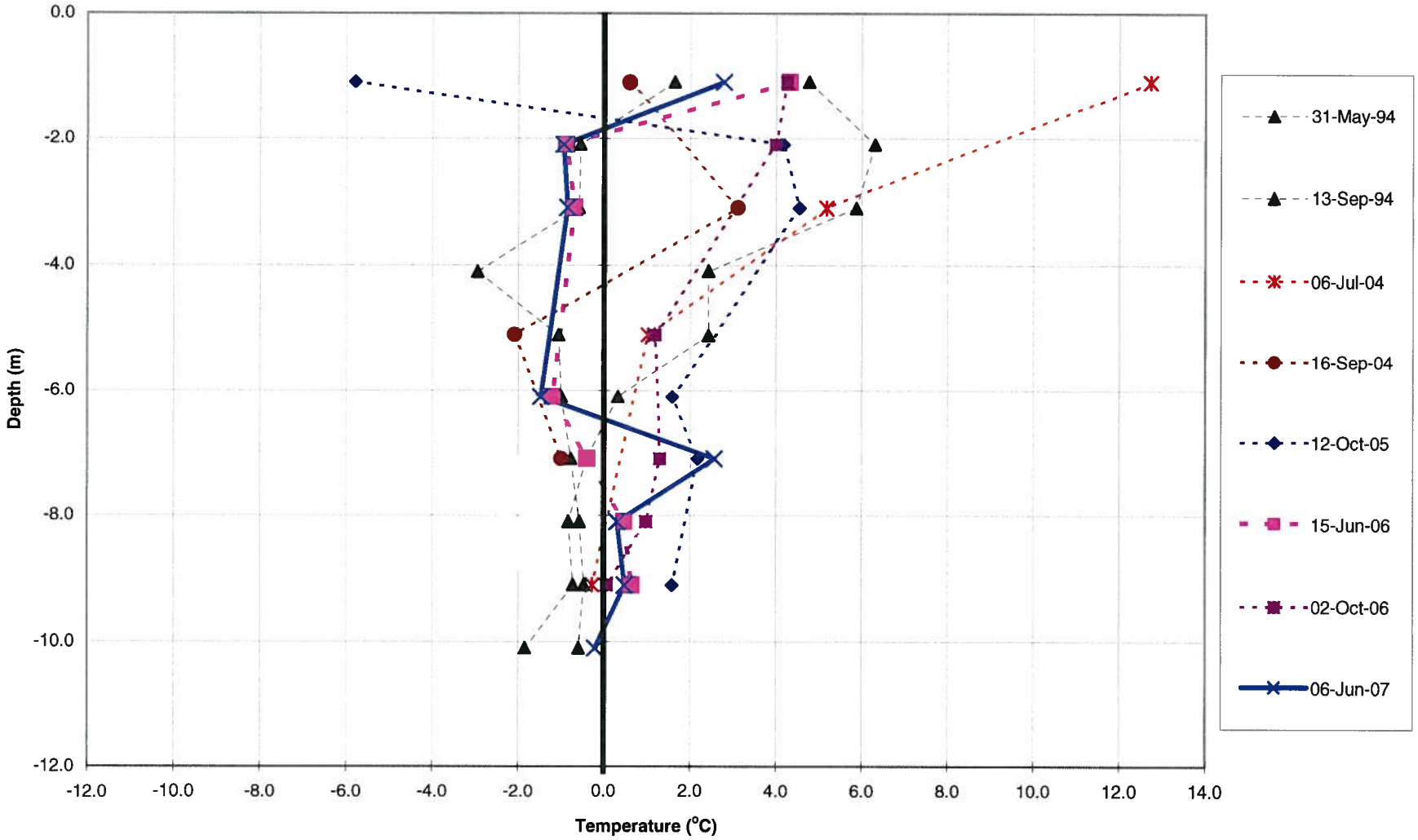
SP-3		Location:	N. of canal dyke St.1+900		Surface Elevation (m amsl):	1051.2	Coordinates:	1394.4 m N & 704.5 m E			
		Date Installed:	1981		Thermistor Type:	Cantec Controls YSI 44007	Ice-Bath Calibration:	applied		Surface Protector:	yes
Thermistor String#25		Depth Correction	0.1								

Depth on String	Actual Depth	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)
(m)	(m)	09-Dec-81	31-May-94	13-Sep-94	20-Sep-95	15-Oct-96	06-Nov-97	15-Nov-98	15-Sep-99	07-Jun-00	05-Sep-00	26-Jun-01	13-Sep-01	13-Jun-02	13-Sep-02	06-Jul-04	16-Sep-04	12-Oct-05	15-Jun-06	02-Oct-06	06-Jun-07	24-Sep-07
1.0	-1.1	16.85	14.88	12.72	12.60	17.37	16.59	17.30	12.15		12.38	13.69	12.31	10.81	12.41	8.65	15.69	21.86	13.01	13.05	14.05	13.73
2.0	-2.1	16.20	16.67	11.81	12.29	15.90	14.88	14.95	12.18	16.73	12.06	14.76	11.81		12.21			13.10	16.93	13.22	16.98	
3.0	-3.1	16.25	16.66	12.04	12.52	15.59	14.43	14.48	12.38	16.48				17.41	11.78	12.46	13.82	12.87	16.76	62.5	16.90	
4.0	-4.1	16.27	16.85	14.32	15.13	16.19	18.09	29.54	nr	nr								53.40	69.30	340.9	92.70	
5.0	-5.1	16.27	17.10	14.32	14.82	15.10	15.06	15.20	15.11	18.93	16.23	23.65	18.05		13.12	15.35	18.00	144.00	300.40	15.23	1.90	
6.0	-6.1	16.39	16.99	15.88	15.31	15.23	14.90	14.80	14.96		14.73	19.10	14.50		13.97	25.52	25.10	14.92	17.21	10.12	17.45	
7.0	-7.1	16.49	16.81	16.50	16.33	16.04	15.52	15.01	15.49		15.27		14.87		14.71		17.03	14.49	16.51	15.15	14.20	
8.0	-8.1	16.54	16.69	16.91	16.80	16.73	16.27	15.39	15.78			18.79	18.79						15.80	15.4	15.93	
9.0	-9.1	16.54	16.60	16.82	16.71	16.70	16.77	15.90	16.01	15.78	15.38	18.50	15.34		15.04	16.41		14.93	15.66	16.13	15.79	
10.0	-10.1	16.48	16.65	17.74	16.77	16.77	16.75	16.68	16.38		15.64					85.10					16.35	

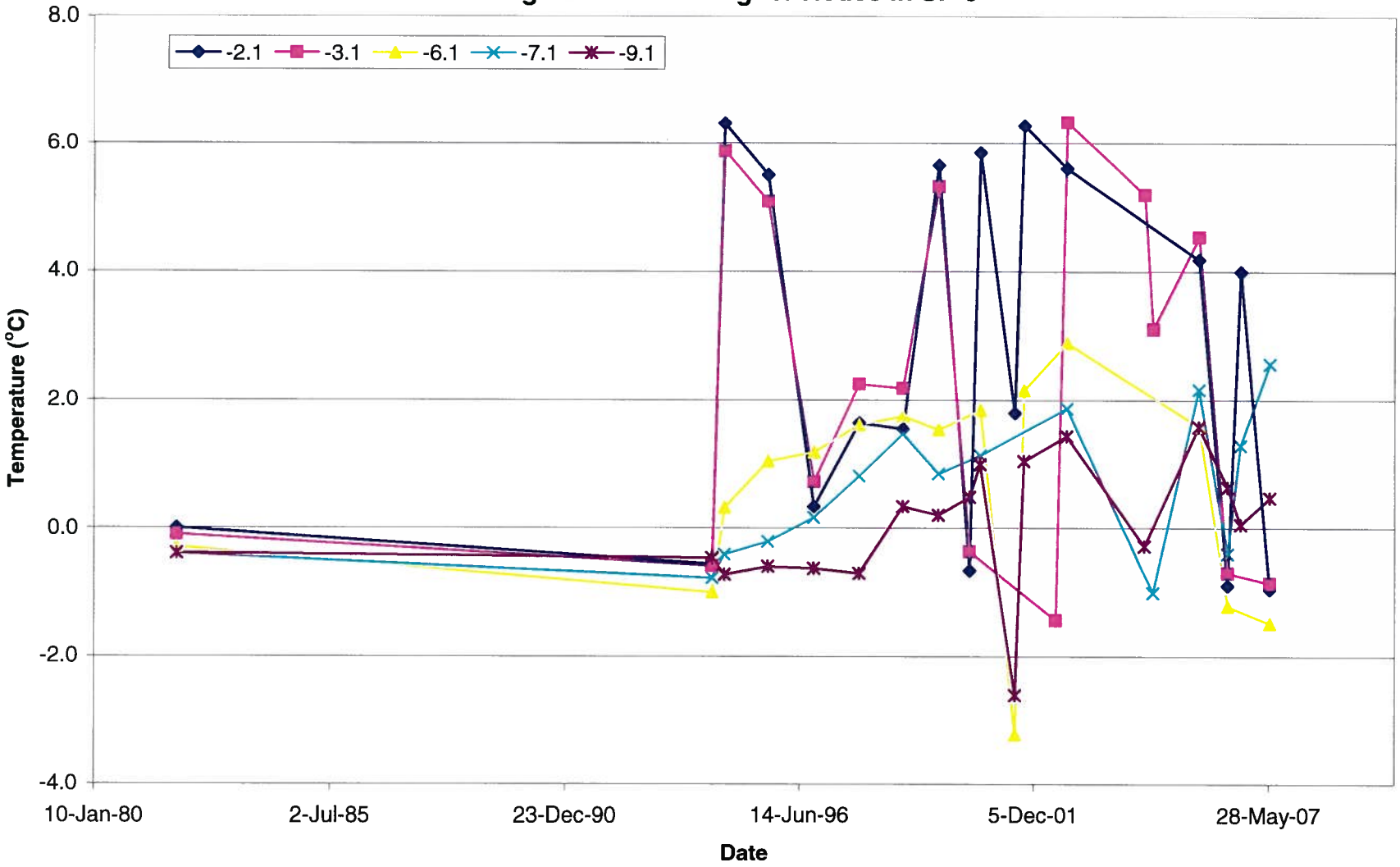
* The initial reading (Nov 15/81) is excluded from the data set because post-installation equilibrium may not have been complete.

Depth on String	Actual Depth	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperatur e (C)	Temperature (C)	Temperature (C)
(m)	(m)	09-Dec-81	31-May-94	13-Sep-94	20-Sep-95	15-Oct-96	06-Nov-97	15-Nov-98	15-Sep-99	07-Jun-00	05-Sep-00	26-Jun-01	13-Sep-01	13-Jun-02	13-Sep-02	06-Jul-04	16-Sep-04	12-Oct-05	15-Jun-06	02-Oct-06	06-Jun-07	24-Sep-07
1.0	-1.1	-0.80	1.64	4.77	4.96	-1.39	-0.50	-1.31	5.70		5.32	3.30	5.44	8.08	5.27	12.72	0.60	-5.80	4.32	4.26	2.78	3.24
2.0	-2.1	0.00	-0.56	6.31	5.50	0.33	1.64	1.55	5.65	-0.66	5.85	1.80	6.28		5.60			4.18	-0.89	4.00	-0.95	
3.0	-3.1	-0.10	-0.59	5.87	5.08	0.72	2.25	2.18	5.32	-0.37				-1.44	6.33	5.19	3.11	4.54	-0.70		-0.86	
4.0	-4.1	-0.10	-2.95	2.42	1.33	-0.02	-2.18															
5.0	-5.1	-0.10	-1.07	2.42	1.74	1.35	1.40	1.22	1.34	-3.05	-0.07	-7.28	-2.14		4.15	1.03	-2.08			1.18		
6.0	-6.1	-0.30	-1.00	0.32	1.04	1.18	1.61	1.75	1.54		1.84	-3.23	2.15		2.89			1.59	-1.21		-1.48	
7.0	-7.1	-0.40	-0.77	-0.41	-0.21	0.16	0.81	1.47	0.85		1.13				1.87		-1.01	2.17	-0.40	1.29	2.57	
8.0	-8.1	-0.40	-0.57	-0.83	-0.70	-0.66	-0.12	0.98	0.48										0.46	0.96	0.30	
9.0	-9.1	-0.40	-0.47	-0.73	-0.60	-0.63	-0.71	0.33	0.20	0.48	0.99	-2.61	1.04		1.43	-0.28		1.57	0.63	0.05	0.47	
10.0	-10.1	-0.40	-0.60	-1.83	-0.74	-0.71	-0.68	-0.60	-0.25		0.66										-0.21	

DIVERSION CANAL SPOIL PILE
Geothermal Monitoring
SP-3



Diversion Canal Spoil Pile
Geothermal Monitoring
Long Term Monitoring for Nodes in SP-3



SPtherm_updated_2007
SP-3 Depth chart

BGC Engineering Inc.

Faro Mine Instrumentation
Diversion Canal Spoil Pile

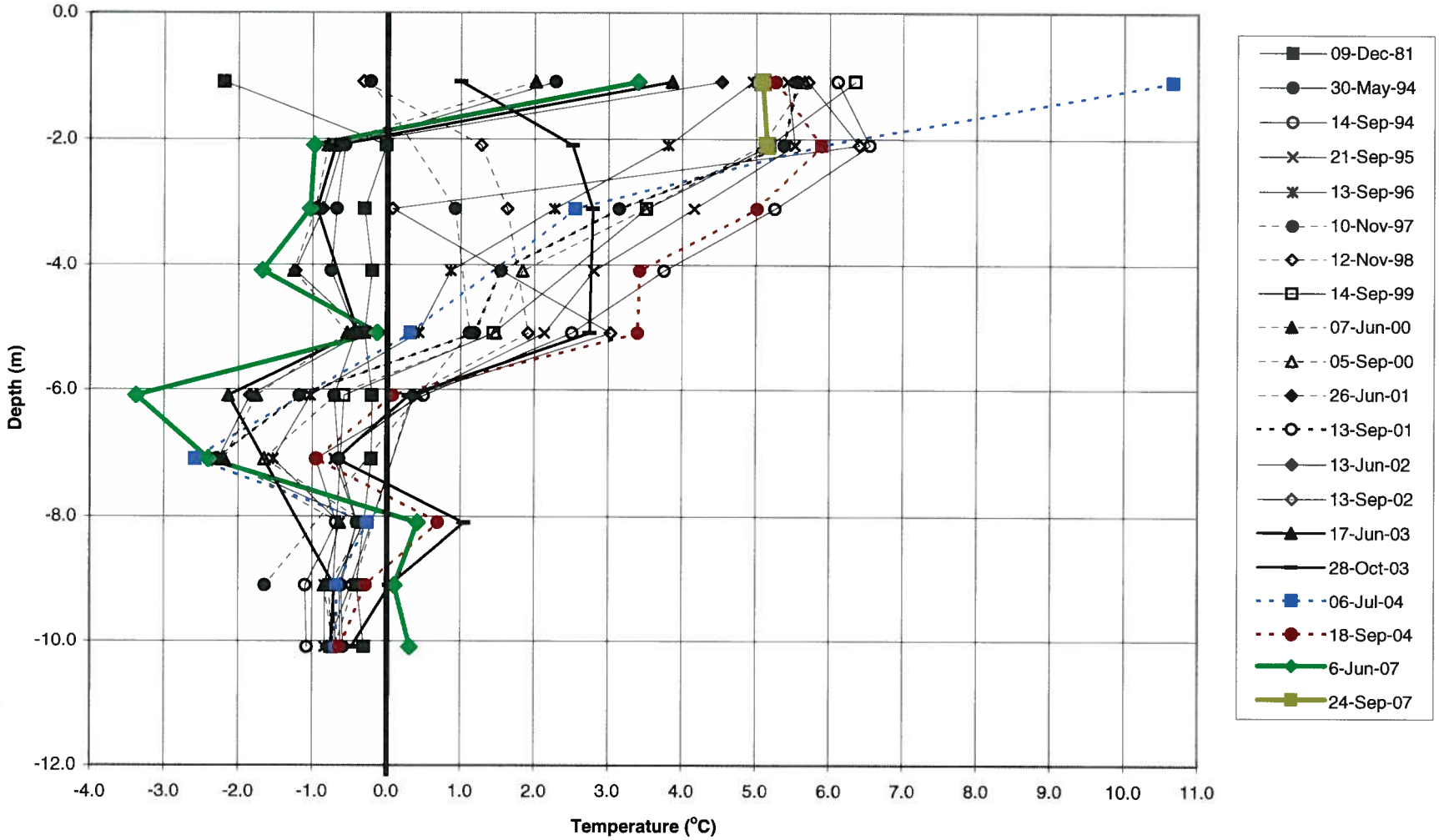
SP-5		Location:	N. of canal dyke St.2+950		Surface Elevation (m amsl):	1045.57	Coordinates:	1898.2 m N & 183.1 m W	8V580012 6913942			
		Date Installed:	1981		Thermistor Type:	Cantec Controls YSI 44007	Ice-Bath Calibration:	applied			Surface Protector:	yes
Thermistor String #24		Depth Correction:	0.1									

Depth on String	Actual Depth	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)
(m)	(m)	9-Dec-81	30-May-94	14-Sep-94	21-Sep-95	13-Sep-96	10-Nov-97	12-Nov-98	14-Sep-99	7-Jun-00	5-Sep-00	26-Jun-01	13-Sep-01	13-Jun-02	13-Sep-02	17-Jun-03	28-Oct-03	6-Jul-04	18-Sep-04	6-Jun-07	24-Sep-07		
1.0	-1.1	18.19	14.47	11.96	12.37	12.66	16.43	16.51	11.82	14.67	12.23	12.84	12.29	12.93	12.20	13.37	15.44	9.59	12.47	13.68	12.58		
2.0	-2.1	16.21	16.68	11.68	12.28	13.37		15.19	12.49	16.88	12.55	17.03	12.37	16.72	11.76	16.79	14.27	12.06	12.06	17.04	12.51		
3.0	-3.1	16.38	16.70	12.39	13.08	14.38	15.39	14.85	13.51	16.95	13.52	16.87	13.76	16.86	16.07	16.93	14.01	14.18	12.54	17.01			
4.0	-4.1	16.32	16.79	13.37	14.02	15.46				17.23	14.72	17.23	14.94	17.21		17.35			13.59	17.61			
5.0	-5.1	16.38	16.48	14.21	14.48	15.78	15.24	14.64	14.99	16.58	14.97	16.51	15.19	16.4	13.84	16.46	14.04	15.87	13.59	16.24			
6.0	-6.1	16.33	16.76	15.76	15.81	17.04		15.89	16.65	17.69	16.75	17.76	17.17	17.77	15.87	18.04	15.92		16.1	19.24			
7.0	-7.1	16.36	16.73	17.00	16.78	17.51				18.12	17.62	18.16	18.22	18.19		18.47	16.75	18.49	16.99	18.32			
8.0	-8.1	16.40	16.48	16.72	16.48	16.68				16.68	16.38	16.50		16.40		16.40	15.31	16.36	15.59	15.81			
9.0	-9.1	16.54	16.72	17.14	16.74	16.91	17.63		16.81	16.92	16.86	16.85		16.80	16.61	16.80	16.17	16.77	16.44	16.12			
10.0	-10.1	16.40	16.64	17.06	16.67	16.85		16.73	16.72	16.75	16.77	16.77		16.75	16.82	16.78	16.54	16.72	16.68	15.89			

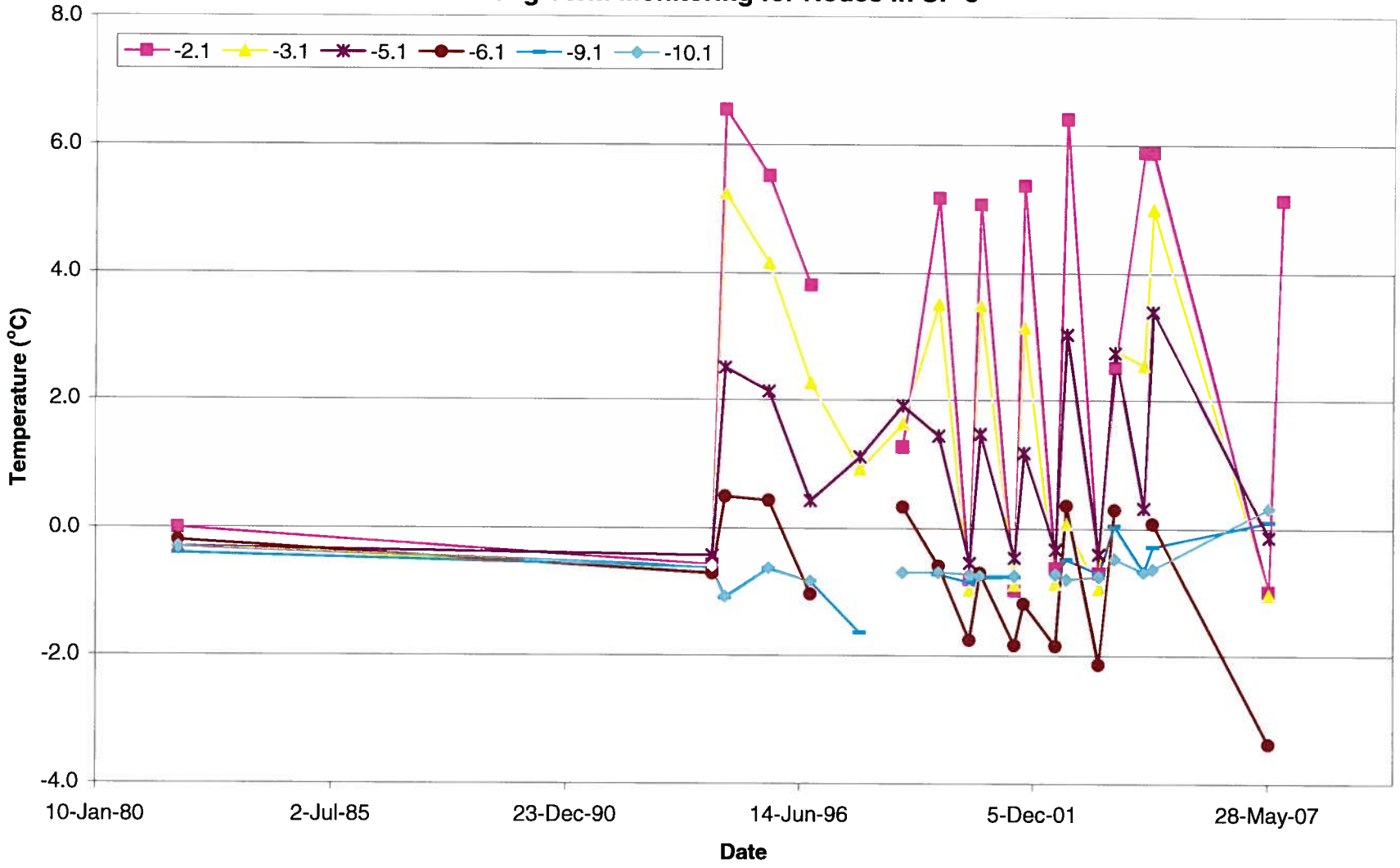
* The initial reading (Nov 15/81) is excluded from the data set because post-installation equilibrium may not have been complete.

Depth on String	Actual Depth	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)
(m)	(m)	09-Dec-81	30-May-94	14-Sep-94	21-Sep-95	13-Sep-96	10-Nov-97	12-Nov-98	14-Sep-99	07-Jun-00	05-Sep-00	26-Jun-01	13-Sep-01	13-Jun-02	13-Sep-02	17-Jun-03	28-Oct-03	06-Jul-04	18-Sep-04	06-Jun-07	24-Sep-07		
1.0	-1.1	-2.20	2.28	6.11	5.43	4.96	-0.22	-0.31	6.35	2.01	5.66	4.67	5.56	4.53	5.71	3.86	1.00	10.65	5.26	3.40	5.09		
2.0	-2.1	0.00	-0.56	6.54	5.52	3.81		1.27	5.18	-0.80	5.08	-0.97	5.38	-0.61	6.40	-0.69	2.51	5.89	5.89	-0.98	5.15		
3.0	-3.1	-0.30	-0.68	5.25	4.16	2.27	0.93	1.63	3.51	-0.97	3.50	-0.87	3.15	-0.86	0.08	-0.94	2.79	2.55	5.01	-1.03			
4.0	-4.1	-0.20	-0.75	3.75	2.80	0.87				-1.25	1.84	-1.25	1.54	-1.23					3.43	-1.68			
5.0	-5.1	-0.30	-0.42	2.51	2.13	0.43	1.12	1.91	1.45	-0.54	1.47	-0.45	1.18	-0.32	3.03	-0.39	2.74	0.32	3.40	-0.13			
6.0	-6.1	-0.20	-0.71	0.50	0.44	-1.03		0.34	-0.58	-1.76	-0.69	-1.83	-1.18	-1.84	0.36	-2.14	0.30		0.08	-3.38			
7.0	-7.1	-0.20	-0.64	-0.95	-0.70	-1.53				-2.19	-1.65	-2.23	-2.30	-2.27			-0.66	-2.58	-0.94	-2.40			
8.0	-8.1	-0.30	-0.40	-0.68	-0.40	-0.63				-0.63	-0.28	-0.42		-0.30			1.05	-0.25	0.69	0.42			
9.0	-9.1	-0.40	-0.61	-1.09	-0.63	-0.83	-1.64		-0.71	-0.84	-0.77	-0.76		-0.70	-0.48	-0.70	0.04	-0.67	-0.28	0.10			
10.0	-10.1	-0.30	-0.59	-1.07	-0.62	-0.83		-0.69	-0.68	-0.71	-0.74	-0.74		-0.71	-0.80	-0.75	-0.47	-0.68	-0.63	0.32			

DIVERSION CANAL SPOIL PILE
Geothermal Monitoring
SP-5

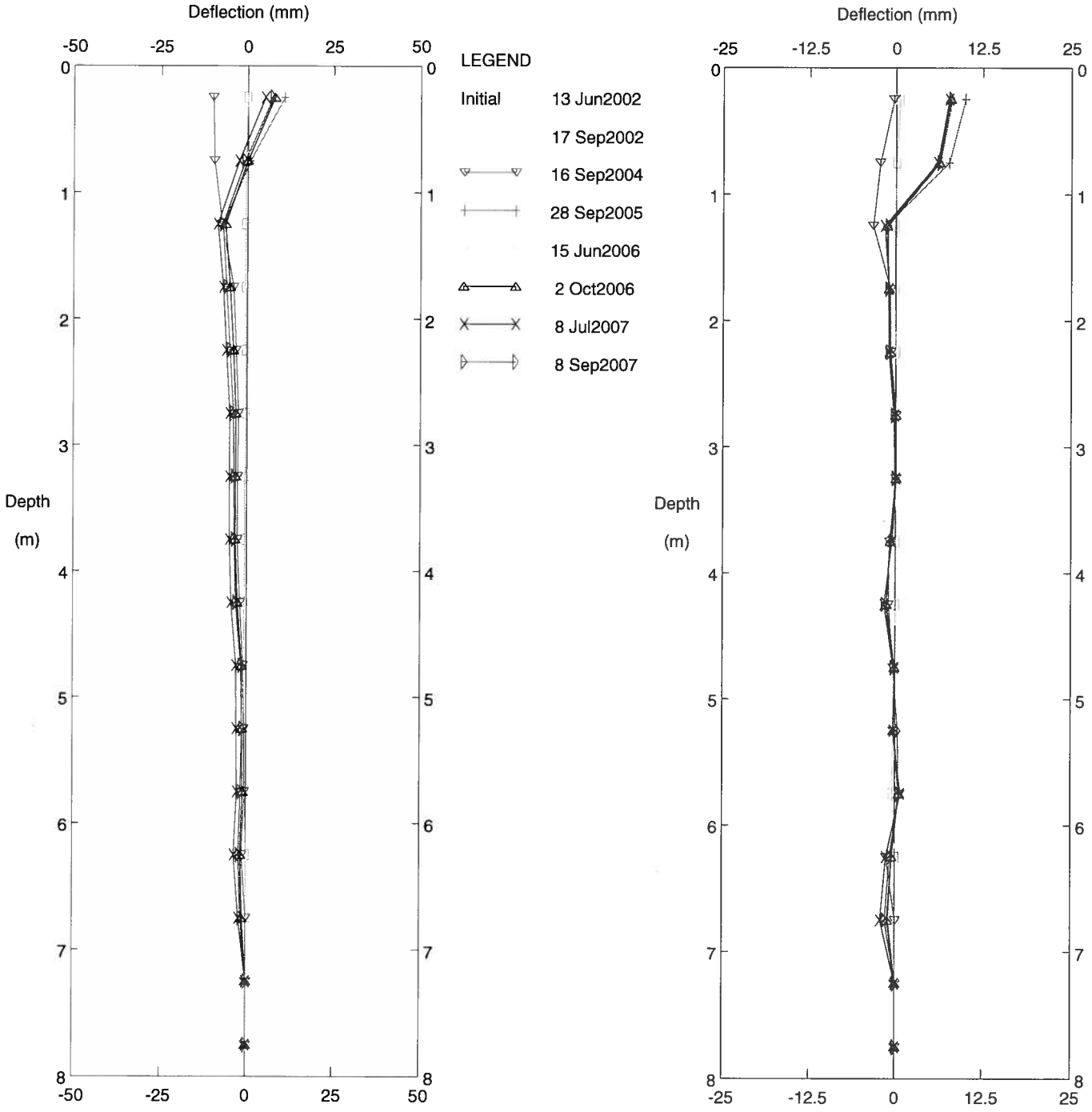


Diversion Canal Spoil Pile
Geothermal Monitoring
Long Term Monitoring for Nodes in SP-5



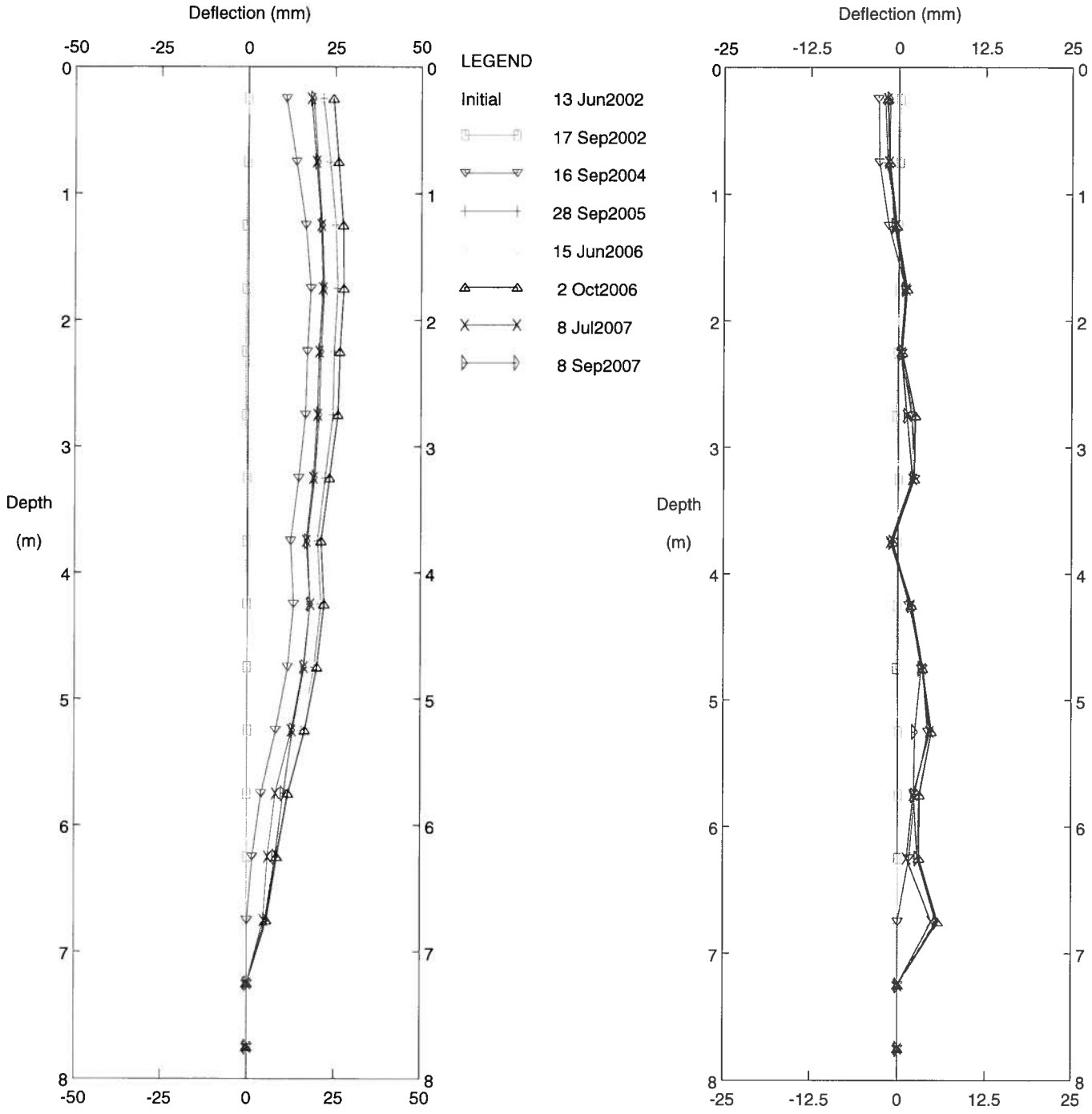
SLOPE INDICATORS

BGC Engineering Inc. - Calgary, AB



SP-2, Inclinometer 1+530

BGC Engineering Inc. - Calgary, AB



Cumulative Deflection

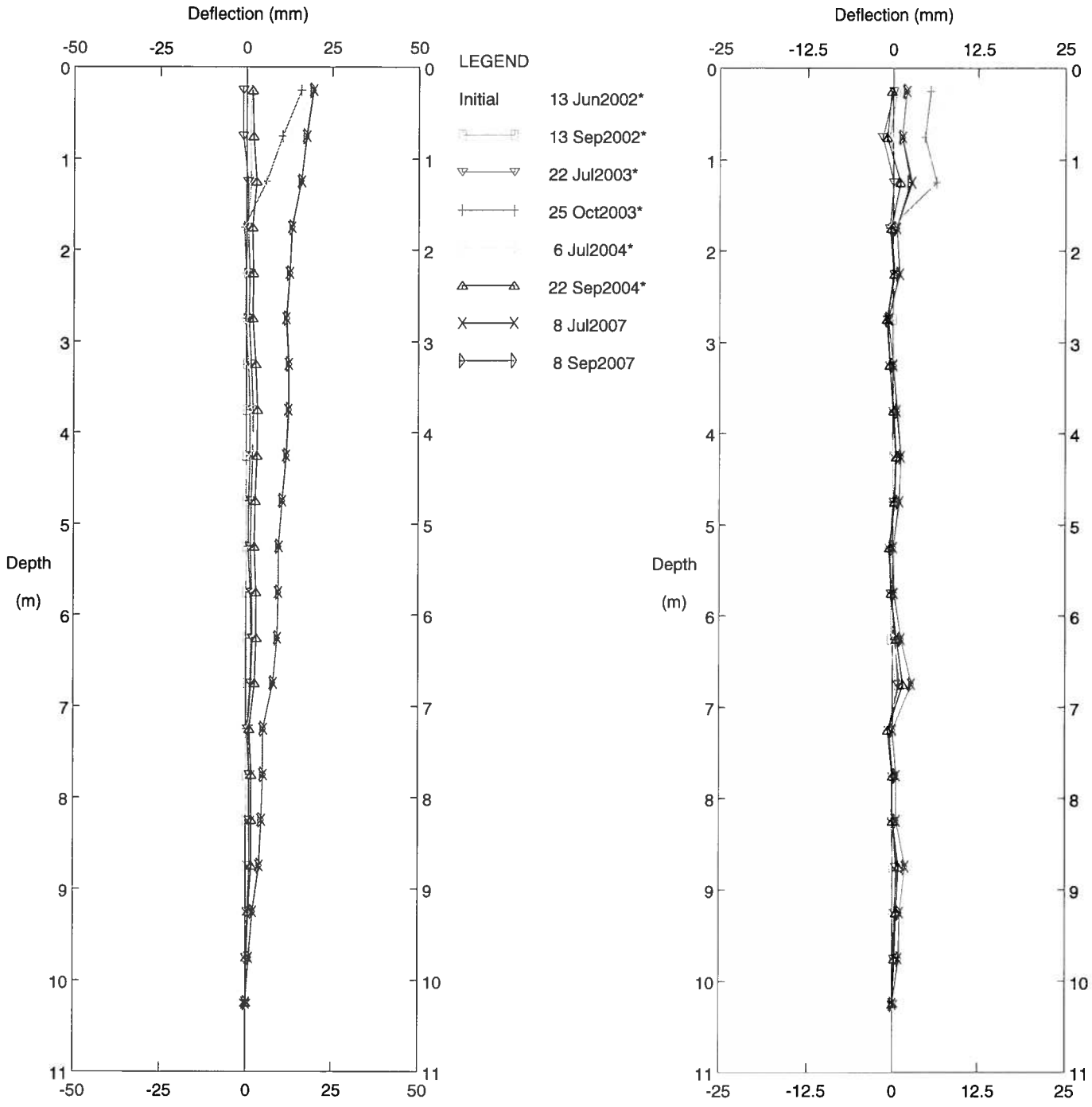
Direction B

Incremental Deflection

Direction B

SP-2, Inclinometer 1+530

BGC Engineering Inc. - Calgary, AB



Cumulative Deflection

Direction A

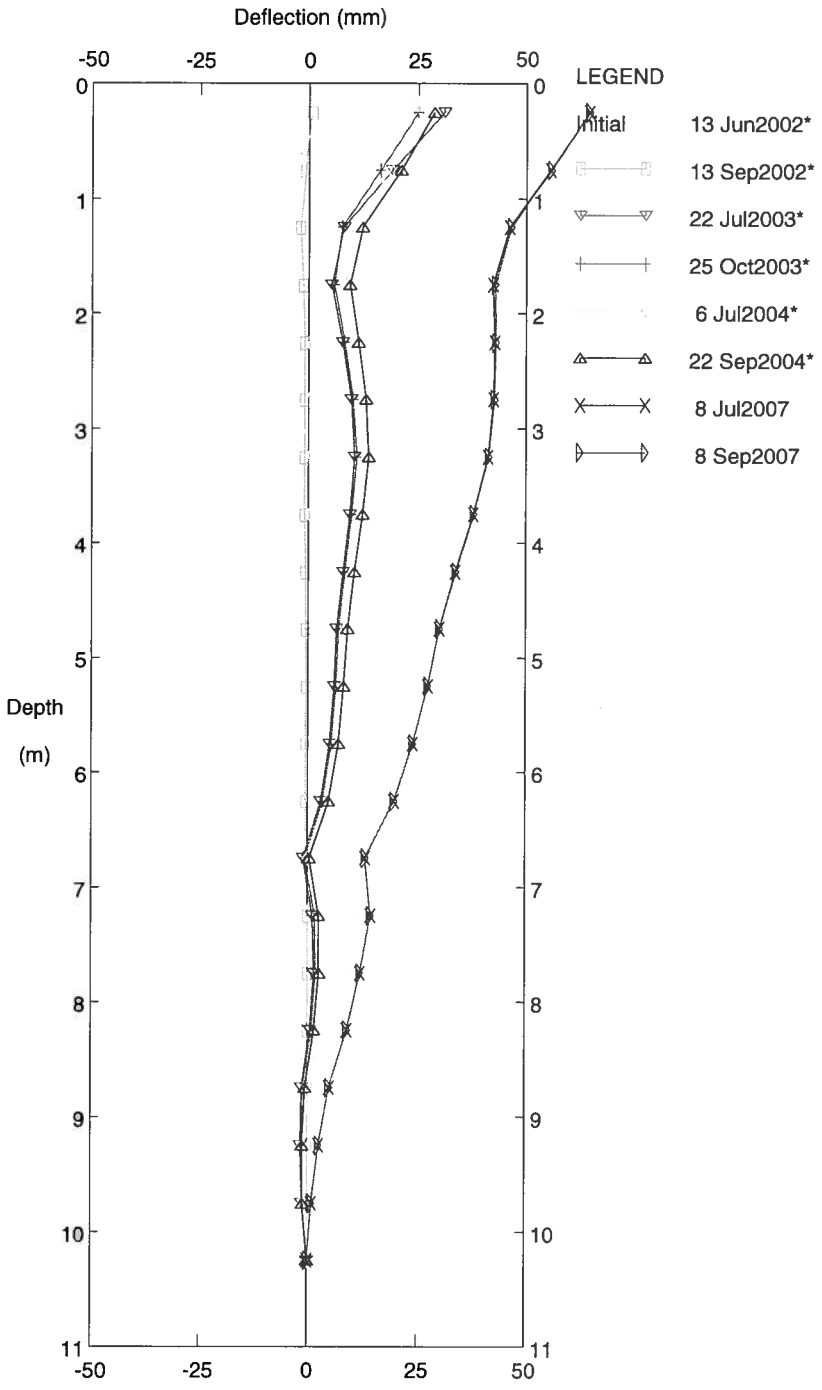
Incremental Deflection

Direction A

SP-5, Inclinometer 2+950

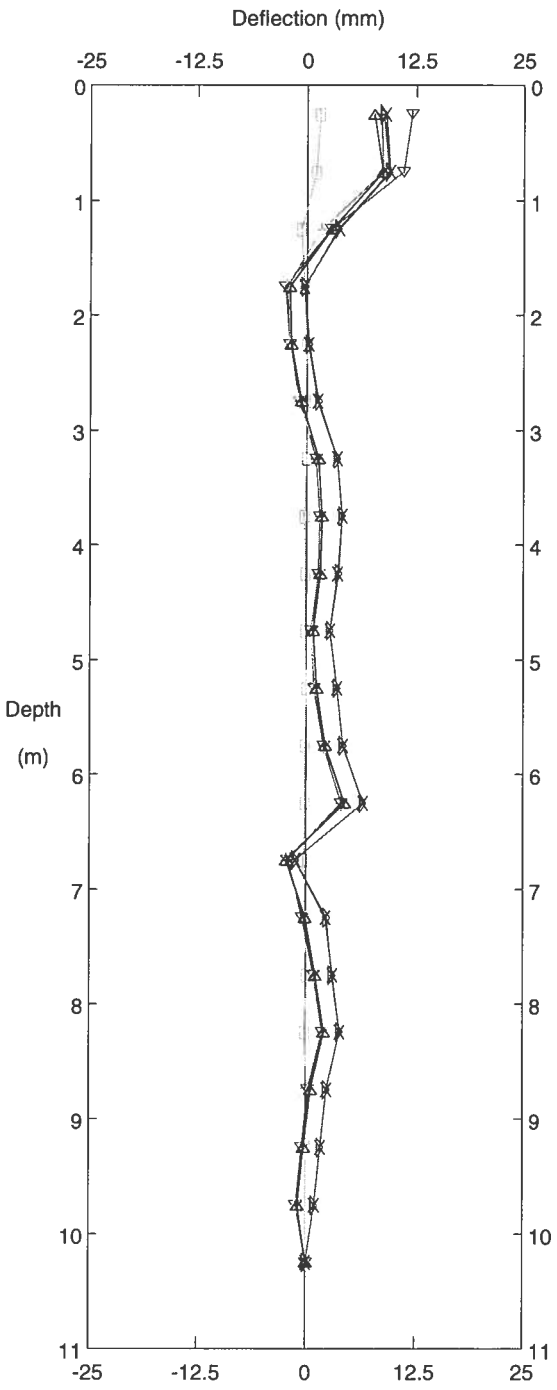
Sets marked * include zero shift and/or rotation corrections.

BGC Engineering Inc. - Calgary, AB



Cumulative Deflection

Direction B



Incremental Deflection

Direction B

SP-5, Inclinometer 2+950

Sets marked * include zero shift and/or rotation corrections.

INTERMEDIATE DAM

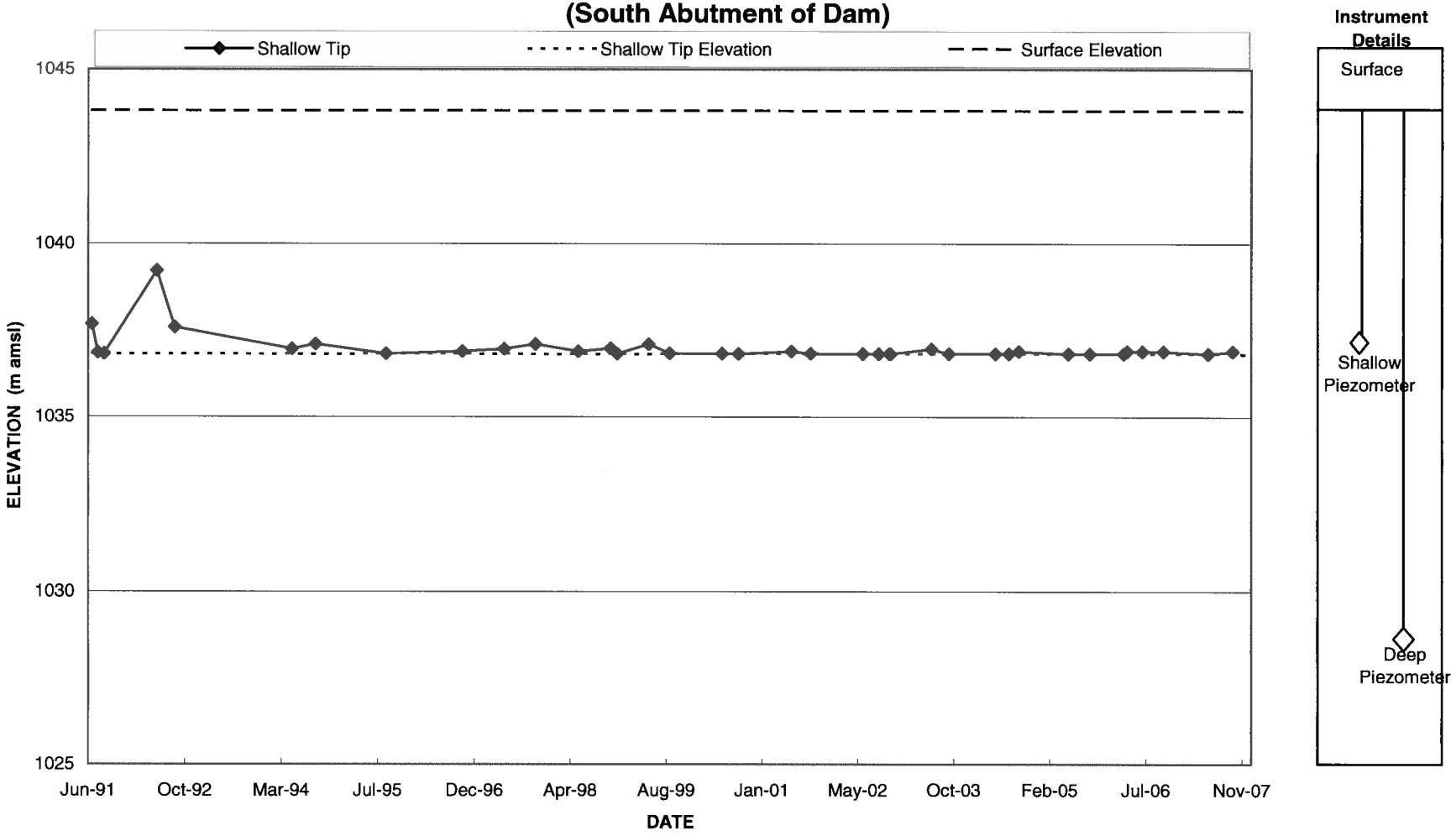
PIEZOMETERS

Faro Mine Instrumentation - Intermediate Dam

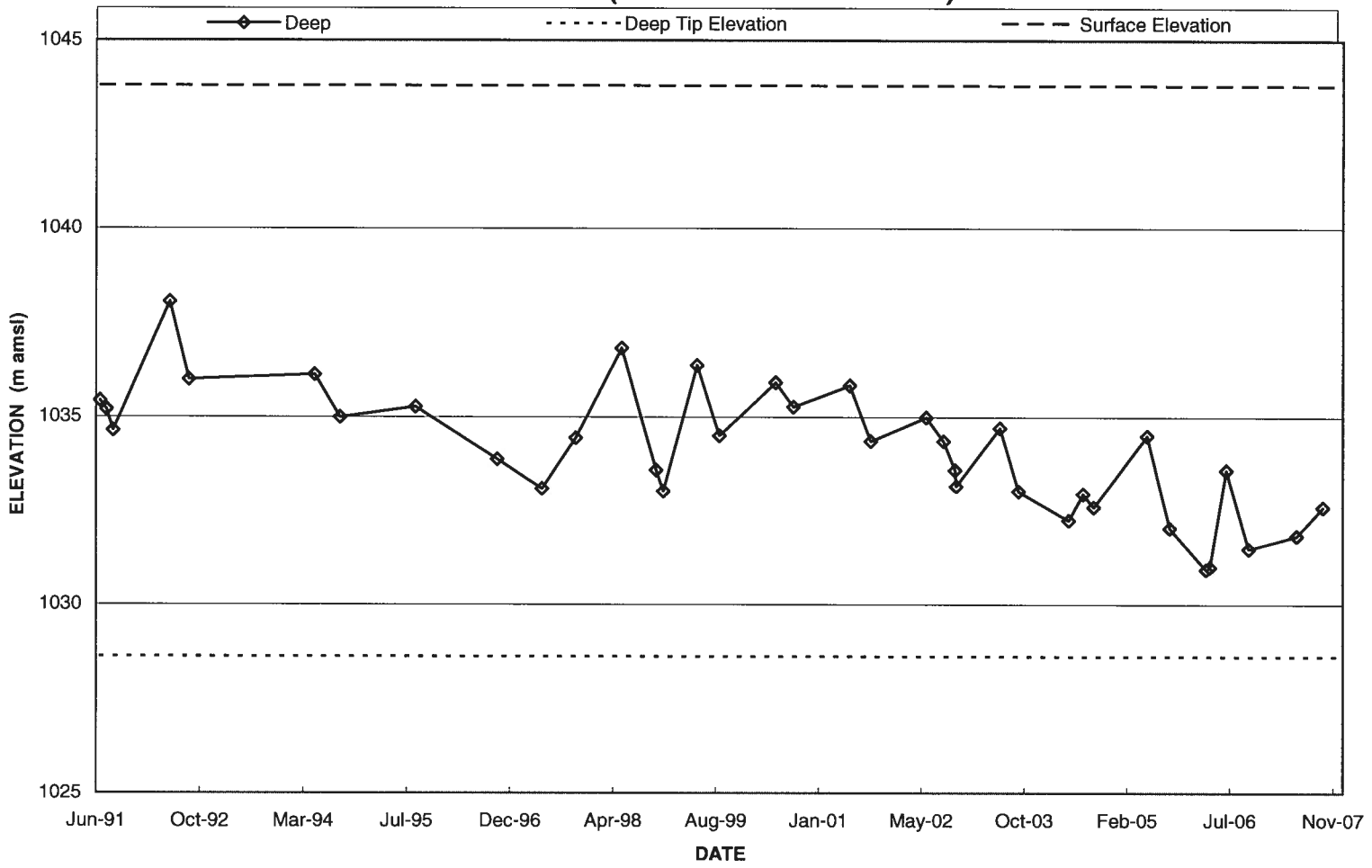
BH91-ID3		Location:	Intermediate Dam South Abutment @ Stn. 0+810	Shallow Tip Elevation (m amsl):	1036.82
		Coordinates:	8V580359 6913723	Deep Tip Elevation (m amsl):	1028.62
Surface Protector:	yes	Date Installed:	1991	2004 Surface Elevation (m amsl):	1043.82

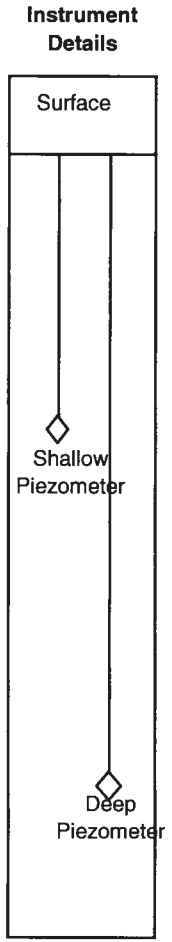
	Reading (psi)		Piezometric Elevation (m amsl)			
Date	Shallow	Deep	Shallow	Deep	Pond El. (m amsl)	Comments
Jul-91	1.23	9.71	1037.68	1035.42	1042.2	
Aug-91	0.04	9.40	1036.85	1035.2	1042.2	
Sep-91		8.60	1036.82	1034.64	1042.2	
Feb-92						
Apr-92						
Jun-92	3.44	13.46	1039.23	1038.04	1047.7	
Sep-92	1.10	10.51	1037.59	1035.98	1047.7	
May-94	0.20	10.70	1036.96	1036.11	1047.7	
Sep-94	0.40	9.10	1037.1	1034.99	1047.7	
Sep-95	0.00	9.50	1036.82	1035.27	1047.7	
Oct-96	0.1	7.5	1036.89	1033.87	1048.1	
7-May-97	0.2	6.4	1036.96	1033.1		
17-Oct-97	0.40	8.31	1037.1	1034.437		
27-May-98	0.10	11.70	1036.89	1036.81	1048.1	
12-Nov-98	0.22	7.10	1036.974	1033.59	1047.8	
16-Dec-98	0.0	6.3	1036.82	1033.03	1047.8	
29-May-99	0.40	11.05	1037.1	1036.355	1048	
16-Sep-99	0.02	8.4	1036.834	1034.5	1047.7	
14-Jun-00	0.01	10.4	1036.827	1035.907	1047.6	
9-Sep-00	0.00	9.5	1036.82	1035.27		
10-Jun-01	0.10	10.3	1036.89	1035.83		
20-Sep-01	0.01	8.2	1036.827	1034.36		
18-Jun-02	0.00	9.1	1036.82	1034.99		
10-Sep-02	0.00	8.20	1036.82	1034.36		
4-Nov-02	0.00	7.10	1036.82	1033.59		
10-Nov-02	0.00	6.50	1036.82	1033.17		
11-Jun-03	0.20	8.70	1036.96	1034.71		*have to continue using old piezometer, tips are too big
10-Sep-03	0.00	6.30	1036.82	1033.03		* Installed new tips, now using new box
10-May-04	0	5.2	1036.82	1032.26		2004 survey data used from this point on
19-Jul-04	0	6.2	1036.82	1032.96		
9-Sep-04	0.1	5.7	1036.89	1032.61		
26-May-05	0	8.4	1036.82	1034.5		
14-Sep-05	0	4.9	1036.82	1032.05		
09-Mar-06	0	3.3	1036.82	1030.93		
27-Mar-06	0.1	3.4	1036.89	1031		
14-Jun-06	0.1	7.1	1036.89	1033.59		
02-Oct-06	0.1	4.1	1036.89	1031.49		
22-May-07	0	4.6	1036.82	1031.84	1046.781	Good Flow
26-Sep-07	0.1	5.7	1036.89	1032.61		

INTERMEDIATE DAM
Piezometric Monitoring
BH91-ID3 Pneumatic Piezometer (Shallow Tip)
(South Abutment of Dam)

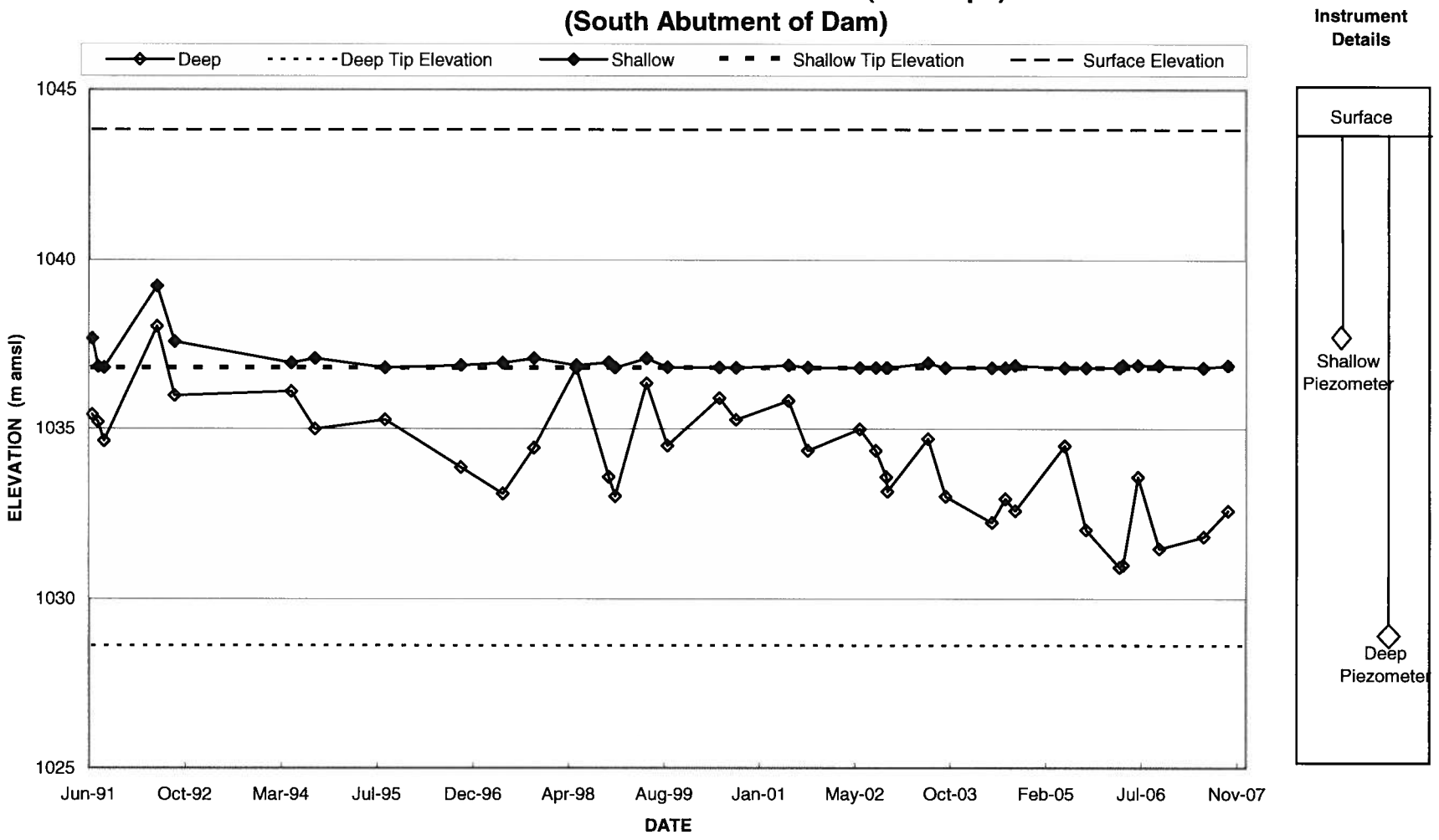


INTERMEDIATE DAM
Piezometric Monitoring
BH91-ID3 Pneumatic Piezometer (Deep Tip)
(South Abutment of Dam)





INTERMEDIATE DAM
Piezometric Monitoring
BH91-ID3 Pneumatic Piezometer (Both Tips)
(South Abutment of Dam)

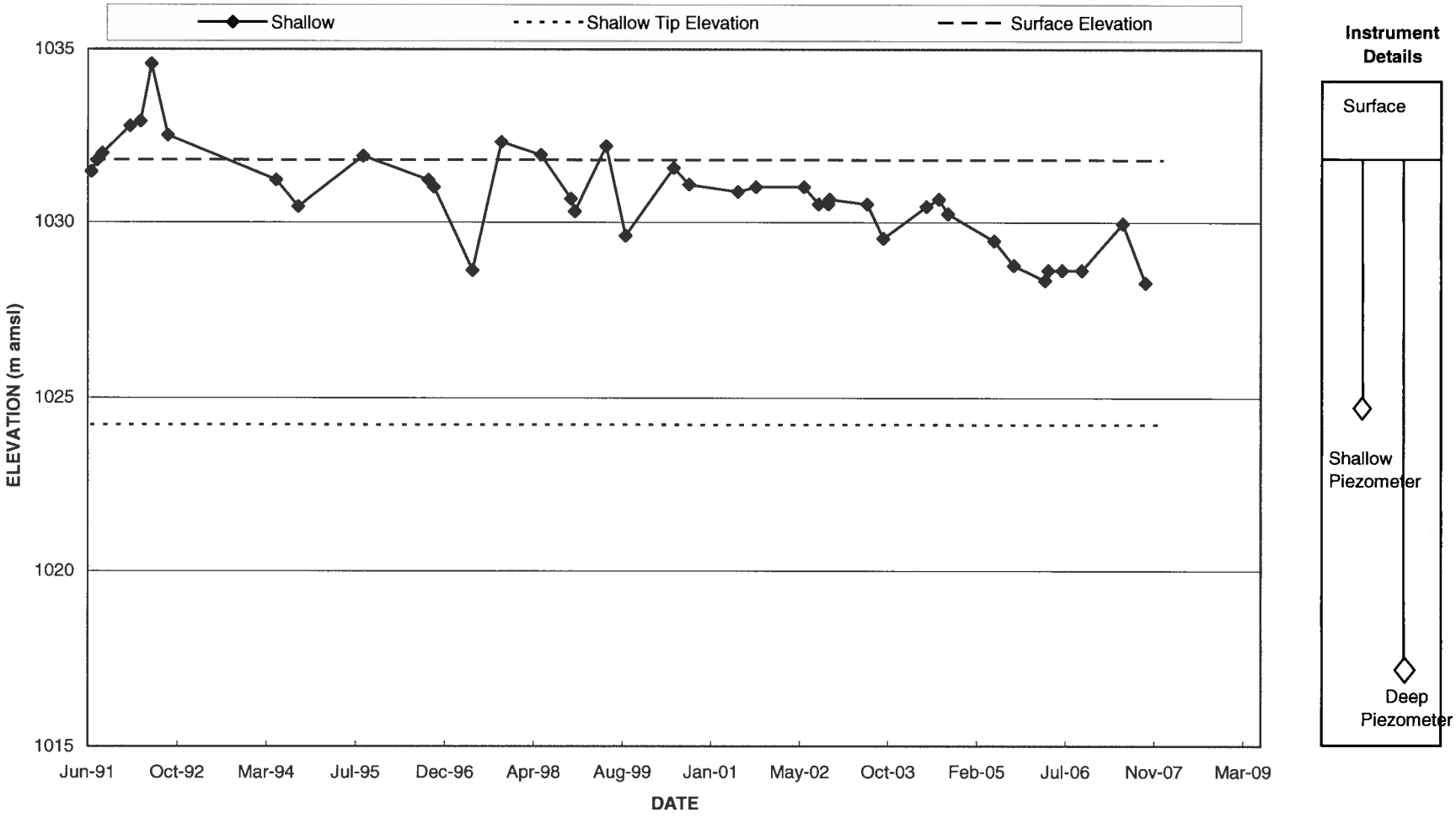


Faro Mine Instrumentation - Intermediate Dam

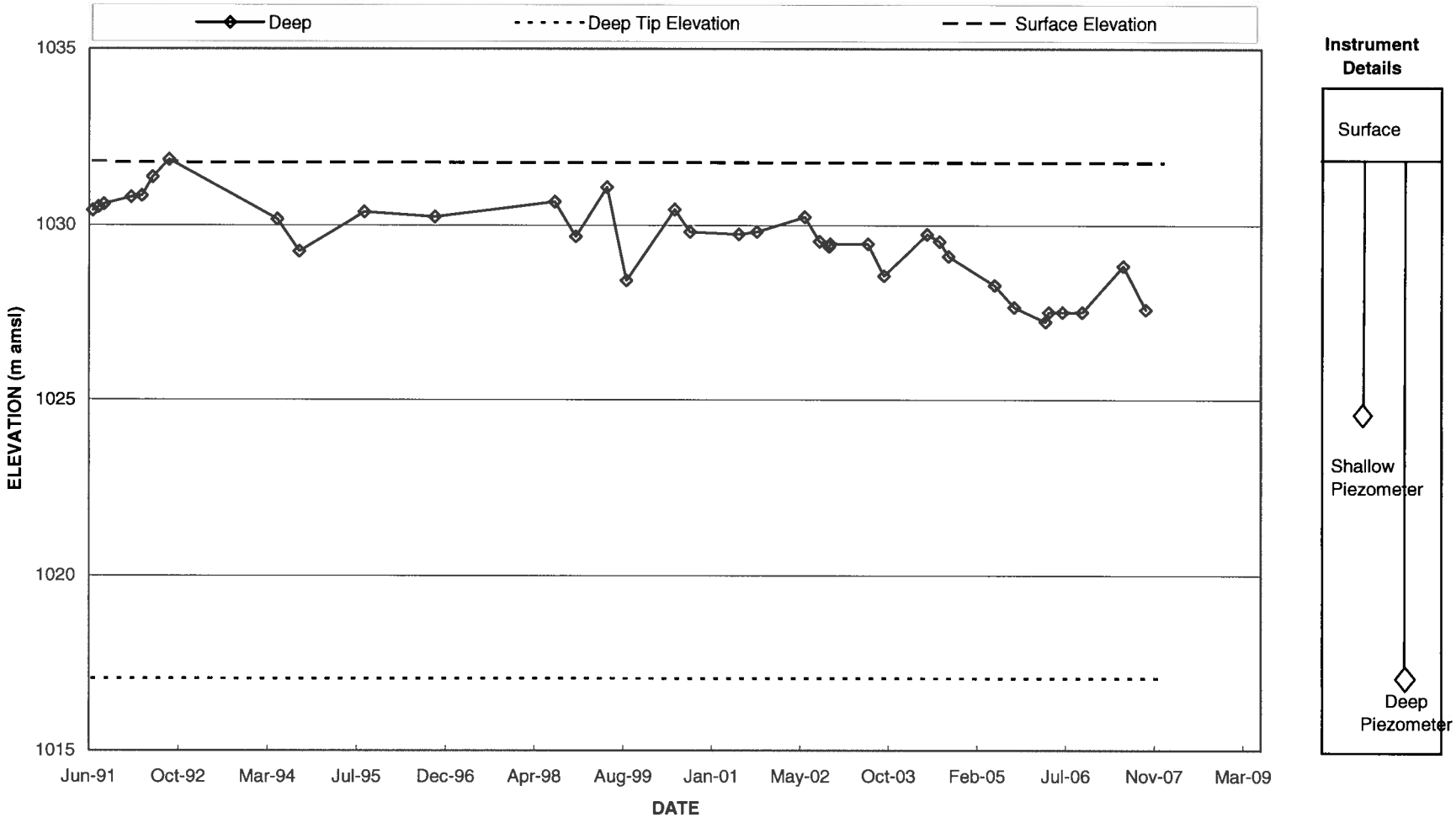
BH91-ID4		Location:	Intermediate Dam Toe @St.0+567	Shallow Tip Elevation (m amsl):	1024.22
		Coordinates:	8V580517 6913926	Deep Tip Elevation (m amsl):	1017.08
Surface Protector:	yes	Date Installed:	1991	*Surface Elevation (m amsl):	1031.80

	Reading (psi)		Piezometric Elevation (m amsl)			
Date	Shallow (upper)	Deep (lower)	Shallow (upper)	Deep (lower)	Pond El. (m amsl)	Comments
Jul-91	10.34	19.06	1031.46	1030.42	1042.2	
Aug-91	10.81	19.20	1031.79	1030.52	1042.2	
Sep-91	11.10	19.30	1031.99	1030.59	1042.2	
Feb-92	12.24	19.59	1032.79	1030.79	1047.7	
Apr-92	12.44	19.64	1032.93	1030.83	1047.7	
Jun-92	14.80	20.40	1034.58	1031.36	1047.7	
Sep-92	11.86	21.10	1032.52	1031.85	1047.7	
May-94	10.00	18.70	1031.22	1030.17	1047.7	
Sep-94	8.90	17.40	1030.45	1029.26	1047.7	
Sep-95	11.00	19.00	1031.92	1030.38	1047.7	
Sep-96	10.00		1031.22		1048.1	
Oct-96	9.7	18.8	1031.01	1030.24		
7-May-97	6.3		1028.63			
17-Oct-97	11.58		1032.33			
27-May-98	11.04		1031.95		1048.1	
7-Aug-98		19.4		1030.66	1048.1	
12-Nov-98	9.22		1030.67		1047.8	
4-Dec-98	8.7	18.0	1030.31	1029.68	1047.8	
29-May-99	11.40	20.00	1032.20	1031.08	1048	
16-Sep-99	7.7	16.2	1029.61	1028.42	1047.7	
14-Jun-00	10.5	19.1	1031.57	1030.45	1047.6	
9-Sep-00	9.8	18.2	1031.08	1029.82		
10-Jun-01	9.50	18.1	1030.87	1029.75		
20-Sep-01	9.70	18.2	1031.01	1029.82		
18-Jun-02	9.70	18.80	1031.01	1030.24		
10-Sep-02	9.00	17.80	1030.52	1029.54		
4-Nov-02	9.00	17.60	1030.52	1029.40		
10-Nov-02	9.20	17.7	1030.66	1029.47		
11-Jun-03	9.00	17.7	1030.52	1029.47		*New piezometer readout used
10-Sep-03	7.60	16.4	1029.54	1028.56		
10-May-04	8.9	18.1	1030.45	1029.75		No 2004 elevation data
19-Jul-04	9.2	17.8	1030.66	1029.54		
9-Sep-04	8.6	17.2	1030.24	1029.12		
26-May-05	7.5	16	1029.47	1028.28		
14-Sep-05	6.5	15.1	1028.77	1027.65		
09-Mar-06	5.9	14.5	1028.35	1027.23		
27-Mar-06	6.3	14.9	1028.63	1027.51		
14-Jun-06	6.3	14.9	1028.63	1027.51		
02-Oct-06	6.3	14.9	1028.63	1027.51		
22-May-07	8.2	16.8	1029.96	1028.84	1046.781	Good Flow
26-Sep-07	5.8	15	1028.28	1027.58		

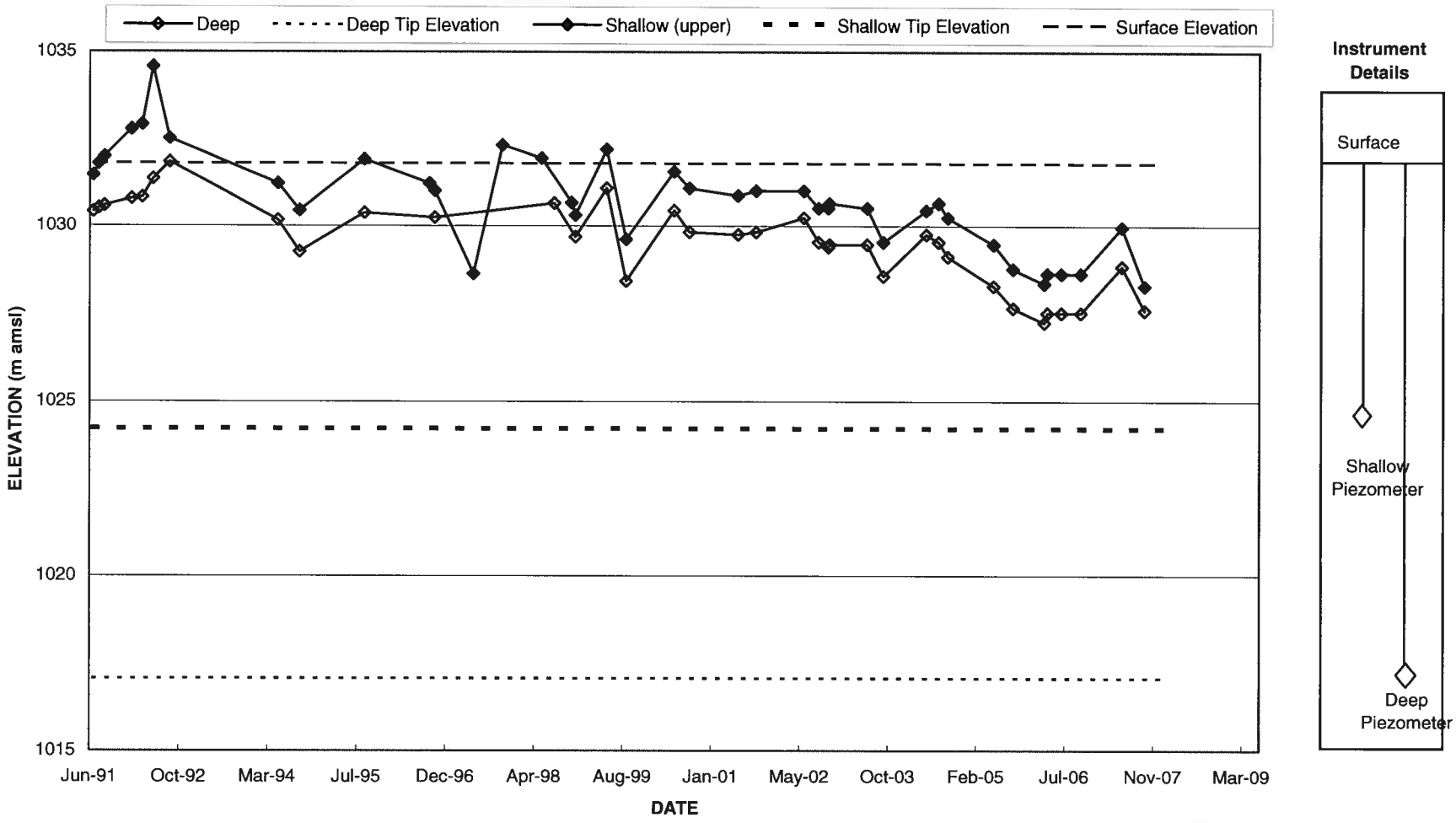
INTERMEDIATE DAM
Piezometric Monitoring
BH91-ID4 Pneumatic Piezometer (Shallow Tip)
(Toe of Dam)



INTERMEDIATE DAM
Piezometric Monitoring
BH91-ID4 Pneumatic Piezometer (Deep Tip)
(Toe of Dam)



INTERMEDIATE DAM
Piezometric Monitoring
BH91-ID4 Pneumatic Piezometer (Both Tips)
(Toe of Dam)



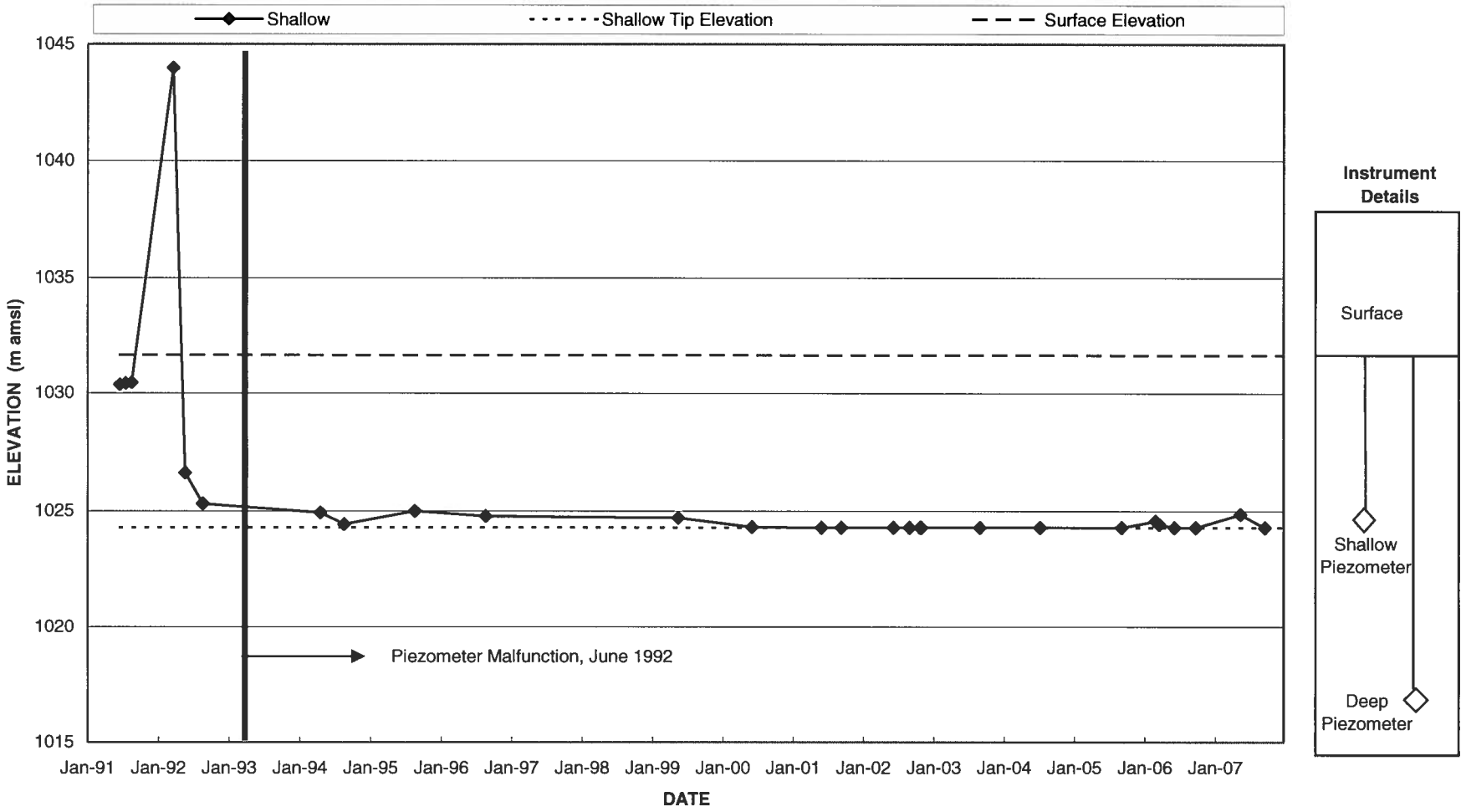
Faro Mine Instrumentation - Intermediate Dam

BH91-ID5		Location:	Intermediate Dam Toe @ St.0+625	Shallow Tip Elevation (m amsl):	1024.30
		Coordinates:	8V580472 6913862	Deep Tip Elevation (m amsl):	1017.08
Surface Protector:	yes	Date Installed:	1991	2004 Surface Elevation (m amsl):	1031.64

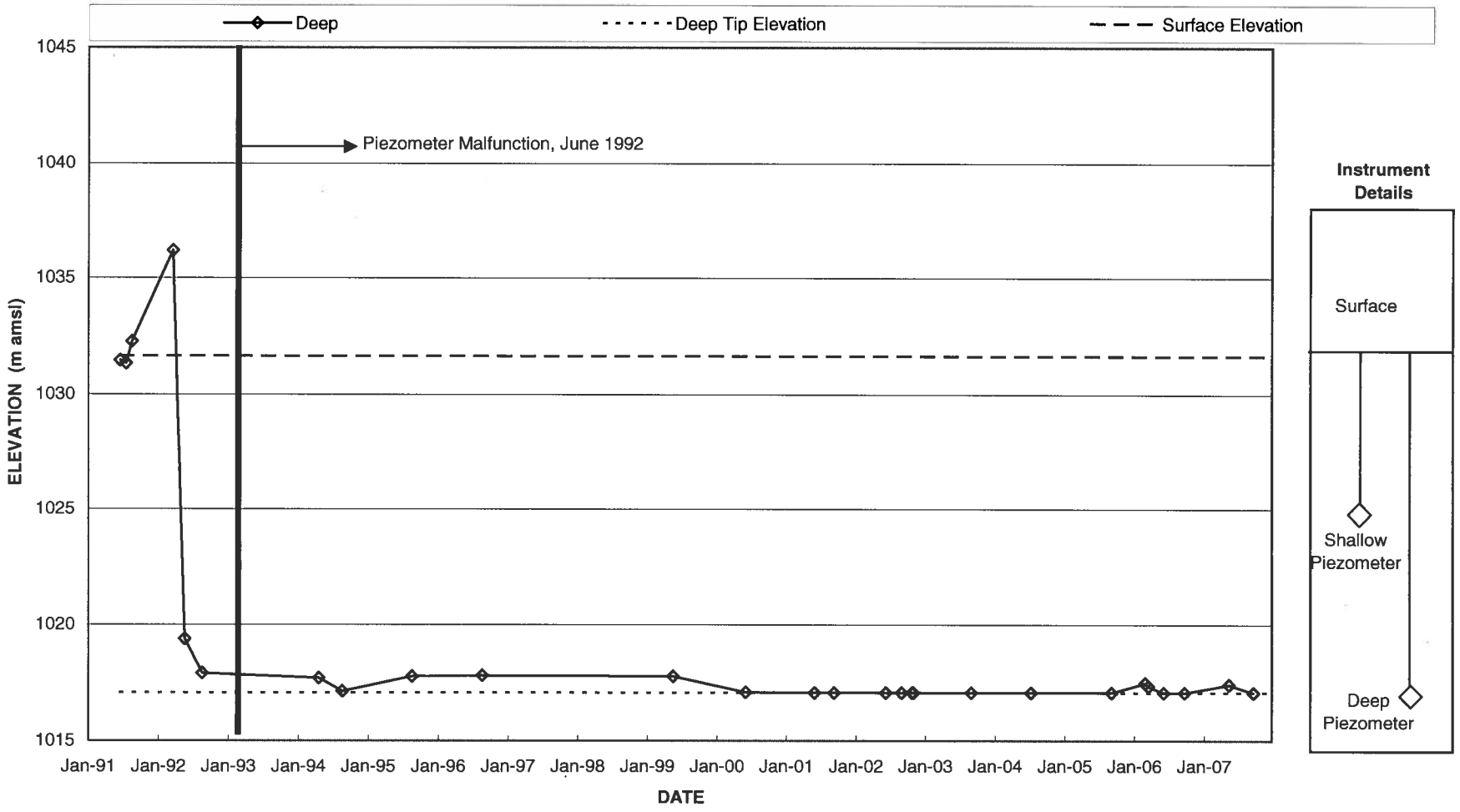
Date		Reading (psi)		Piezometric Elevation (m amsl)			
		Shallow (upper)	Deep (lower)	Shallow (upper)	Deep (lower)	Pond El. (m amsl)	Comments
Jul-91		8.67	20.54	1030.37	1031.46	1042.2	
Aug-91		8.76	20.36	1030.43	1031.33	1042.2	
Sep-91		8.80	21.70	1030.46	1032.27	1042.2	
Feb-92							
Apr-92		28.10	27.30	1043.97	1036.19	1047.7	
Jun-92		3.30	3.30	1026.61	1019.39	1047.7	
Sep-92		1.46	1.20	1025.32	1017.92	1047.7	
May-94		0.90	0.90	1024.93	1017.71	1047.7	
Sep-94		0.20	0.10	1024.44	1017.15	1047.7	
Sep-95		1.00	1.00	1025	1017.78	1047.7	
Sep-96		0.7	1.05	1024.79	1017.815	1048.1	
07-May-97		no reading					
17-Oct-97		no reading					
27-May-98		no reading					
29-May-99		0.60	1.00	1024.72	1017.78	1048	
16-Sep-99		no reading; no bubbles					
14-Jun-00		0.03	0.03	1024.321	1017.101	1047.6	
10-Jun-01		0.00	0	1024.3	1017.08		
20-Sep-01		0.00	0.00	1024.3	1017.08		
18-Jun-02		0.00	0	1024.3	1017.08		
10-Sep-02		0.00	0	1024.3	1017.08		
04-Nov-02		0.00	0	1024.3	1017.08		
10-Nov-02		0.00	0	1024.3	1017.08		
10-Sep-03		0.00	0	1024.3	1017.08		
19-Jul-04		0.00	0	1024.30	1017.08		2004 survey data used from here on
Sep-05		0.00	0	1024.3	1017.08		
09-Mar-06		0.4	0.6	1024.58	1017.5		
27-Mar-06		0.2	0.4	1024.44	1017.36		no bubbles
14-Jun-06		0	0	1024.3	1017.08		
02-Oct-06		0	0	1024.3	1017.08		
22-May-07		0.8	0.5	1024.86	1017.43	1046.781	lower won't stabilize
26-Sep-07		0	0	1024.3	1017.08		No bubbles

Both tips have leaking leads as of June, 1992.

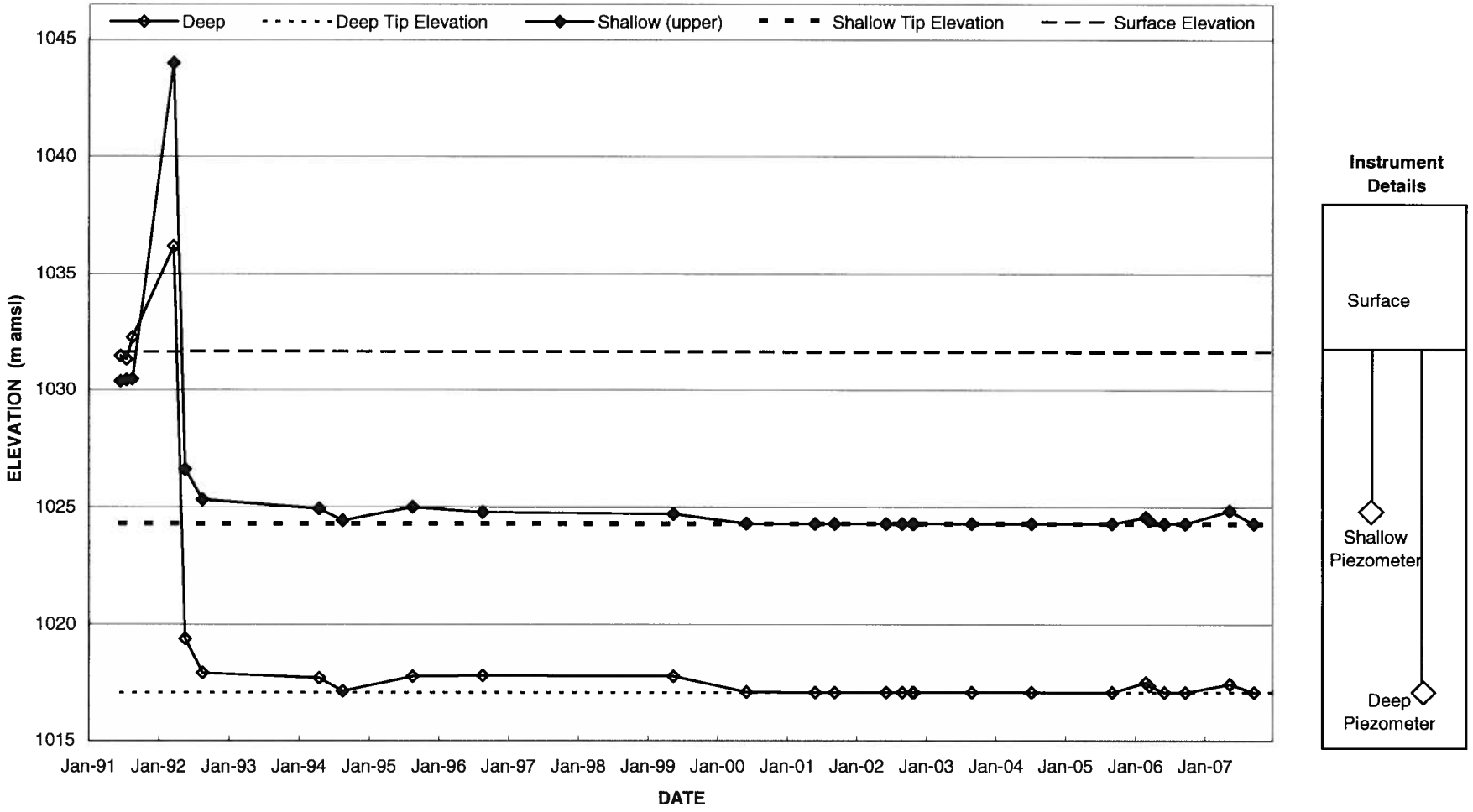
INTERMEDIATE DAM
Piezometric Monitoring
BH91-ID5 Pneumatic Piezometer (Shallow Tip)
(Toe of Dam)



INTERMEDIATE DAM
Piezometric Monitoring
BH91-ID5 Pneumatic Piezometer (Deep Tip)
(Toe of Dam)



INTERMEDIATE DAM
Piezometric Monitoring
BH91-ID5 Pneumatic Piezometer (Both Tips)
(Toe of Dam)

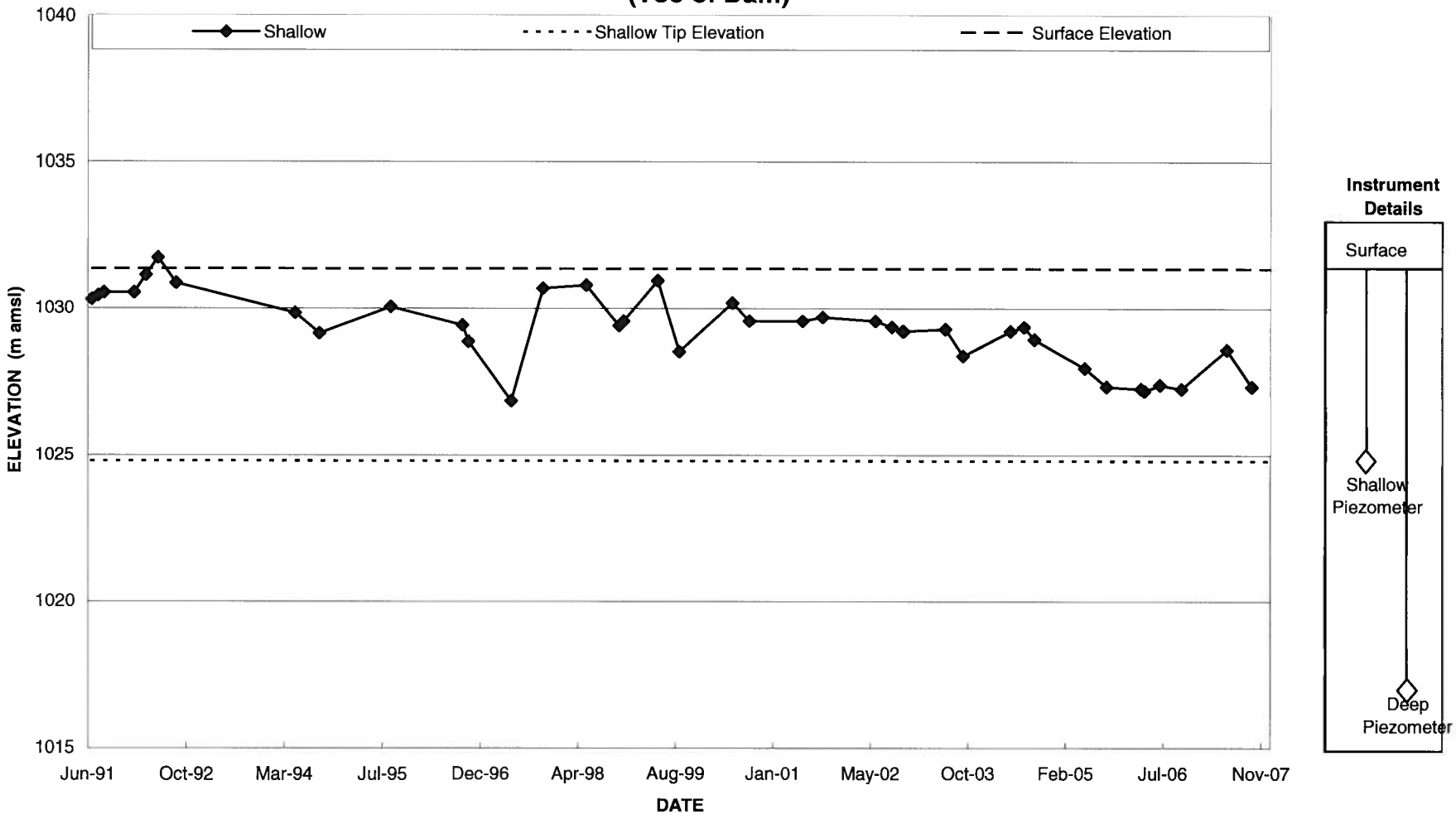


Faro Mine Instrumentation - Intermediate Dam

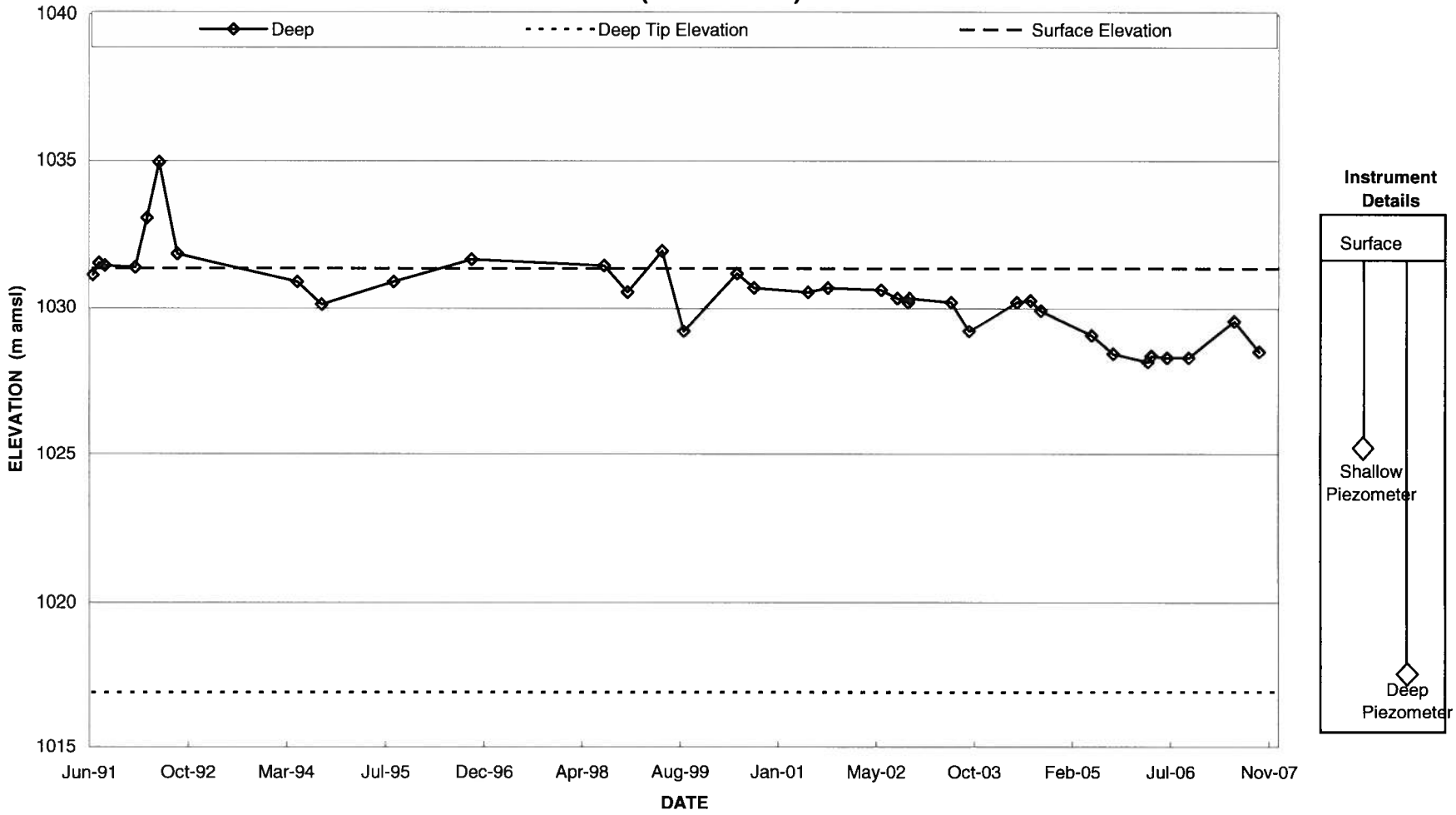
BH91-ID6		Location:	Intermediate Dam Toe @St.0+630	Shallow Tip Elevation (m amsl):	1024.80
		Coordinates:	8V580475 6913866	Deep Tip Elevation (m amsl):	1016.90
Surface Protector:	yes	Date Installed:	1991	2004 Surface Elevation (m amsl):	1031.36

Date		Reading (psi)		Piezometric Elevation (m amsl)		Pond El. (m amsl)	Comments
		Shallow (upper)	Deep (lower)	Shallow (upper)	Deep (lower)		
Jul-91		7.89	20.33	1030.32	1031.13	1042.2	
Aug-91		8.06	20.91	1030.44	1031.54	1042.2	
Sep-91		8.20	20.80	1030.54	1031.46	1042.2	
Feb-92		8.20	20.70	1030.54	1031.39	1047.7	
Apr-92		9.06	23.10	1031.14	1033.07	1047.7	
Jun-92		9.91	25.80	1031.74	1034.96	1047.7	
Sep-92		8.67	21.36	1030.87	1031.85	1047.7	
May-94		7.20	20.00	1029.84	1030.9	1047.7	
Sep-94		6.20	18.90	1029.14	1030.13	1047.7	
Sep-95		7.50	20.00	1030.05	1030.9	1047.7	
Sep-96		6.6		1029.42		1048.1	
Oct-96		5.8	21.1	1028.86	1031.67		
7-May-97		2.9		1026.83			
17-Oct-97		8.41		1030.687			
27-May-98		8.56		1030.792		1048.1	
7-Aug-98			20.8		1031.46	1048.1	
12-Nov-98		6.57		1029.399		1047.8	
4-Dec-98		6.8	19.5	1029.56	1030.55	1047.8	
29-May-99		8.78	21.50	1030.946	1031.95	1048	
16-Sep-99		5.3	17.60	1028.51	1029.22	1047.7	
14-Jun-00		7.7	20.41	1030.19	1031.187	1047.6	
9-Sep-00		6.8	19.70	1029.56	1030.69		
10-Jun-01		6.80	19.50	1029.56	1030.55		
20-Sep-01		7.00	19.70	1029.7	1030.69		
18-Jun-02		6.80	19.60	1029.56	1030.62		
10-Sep-02		6.50	19.20	1029.35	1030.34		
4-Nov-02		6.30	19.00	1029.21	1030.2		
10-Nov-02		6.30	19.2	1029.21	1030.34		
11-Jun-03		6.40	19	1029.28	1030.2		*New piezometer started use here
10-Sep-03		5.10	17.6	1028.37	1029.22		
10-May-04		6.3	19	1029.21	1030.2		2004 survey data used from this point on
19-Jul-04		6.5	19.1	1029.35	1030.27		
9-Sep-04		5.9	18.6	1028.93	1029.92		
26-May-05		4.5	17.4	1027.95	1029.08		
14-Sep-05		3.6	16.5	1027.32	1028.45		
09-Mar-06		3.5	16.1	1027.25	1028.17		
27-Mar-06		3.4	16.4	1027.18	1028.38		3.4/3.5 won't stabilize
14-Jun-06		3.7	16.3	1027.39	1028.31		
02-Oct-06		3.5	16.3	1027.25	1028.31		
22-May-07		5.4	18.1	1028.58	1029.57	1046.781	Good flow
26-Sep-07		3.6	16.6	1027.32	1028.52		

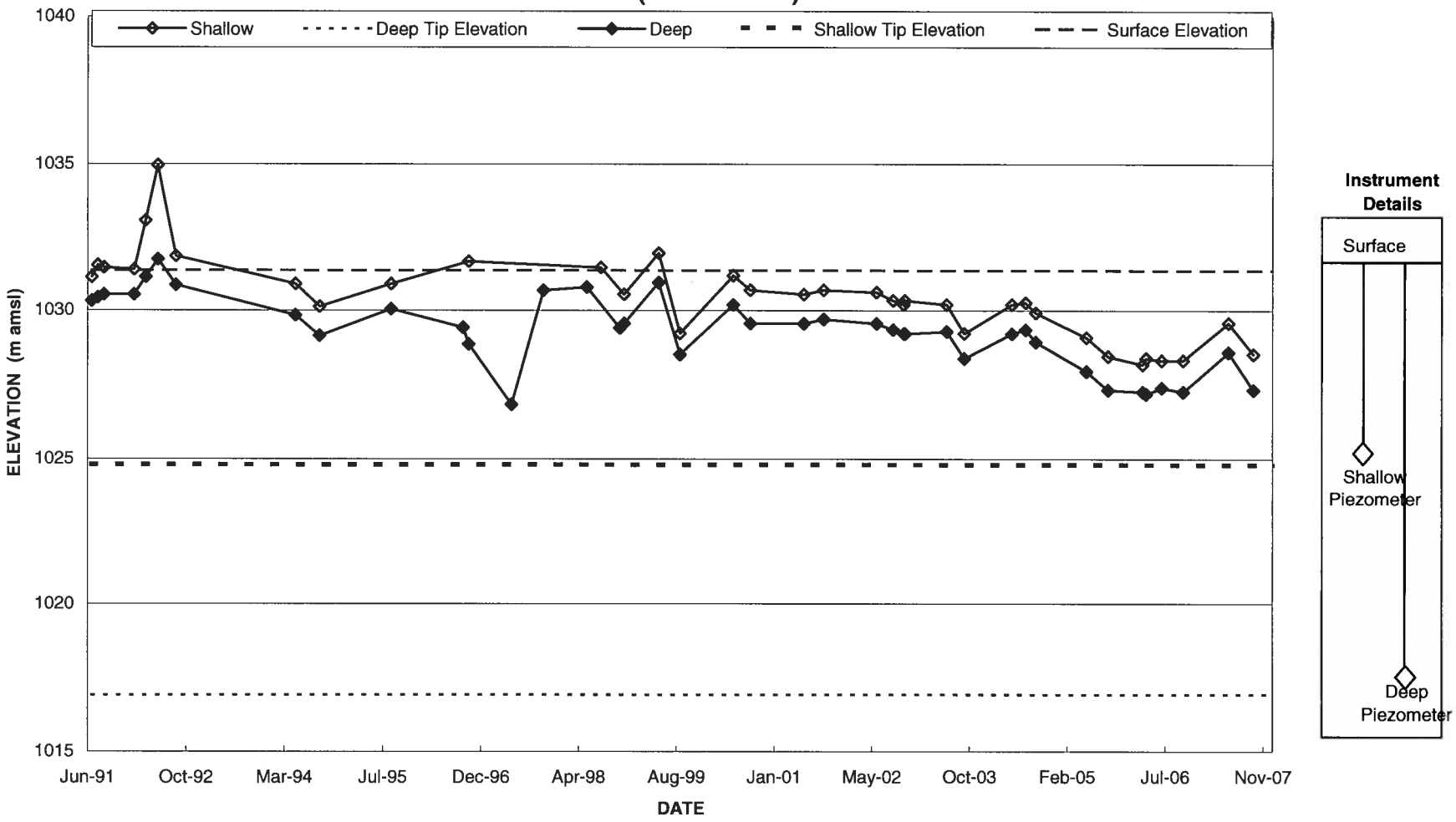
INTERMEDIATE DAM
Piezometric Monitoring
BH91-ID6 Pneumatic Piezometer (Shallow Tip)
(Toe of Dam)



INTERMEDIATE DAM
Piezometric Monitoring
BH91-ID6 Pneumatic Piezometer (Deep Tip)
(Toe of Dam)



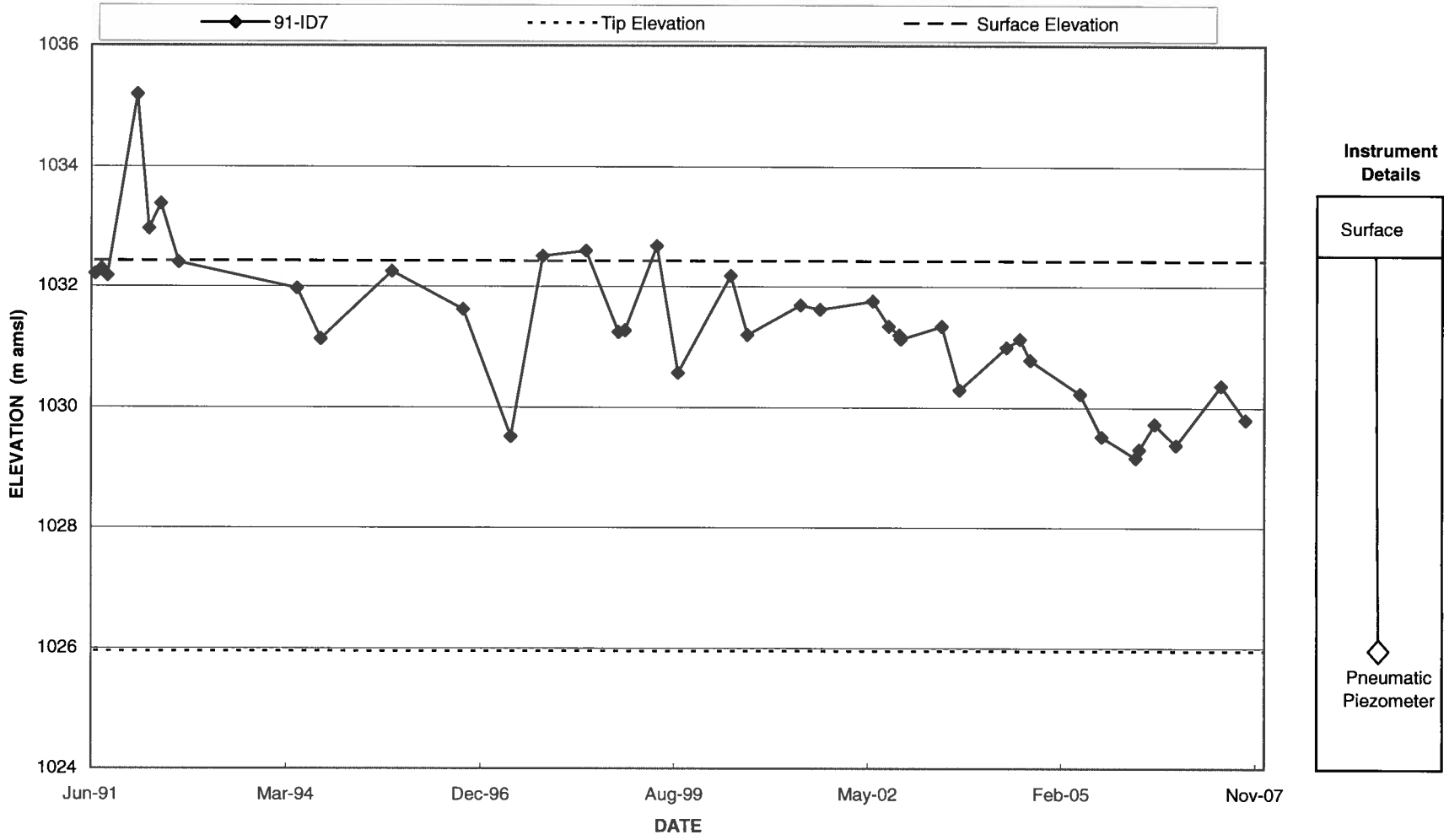
INTERMEDIATE DAM
Piezometric Monitoring
BH91-ID6 Pneumatic Piezometer (Both Tips)
(Toe of Dam)



Faro Mine Instrumentation - Intermediate Dam

BH91-ID7		Location:	Intermediate Dam Toe @St.0+759		
		Coordinates:	8V580377 6913751	Tip Elevation (m amsl):	1025.95
Surface Protector:	yes	Date Installed:	1991	2004 Ground Elevation (amsl):	1032.42
Date		Reading (psi)	Piezometric Elevation (m amsl)	Pond El. (m amsl)	Comments
Jul-91		8.94	1032.21	1042.2	
Aug-91		9.06	1032.29	1042.2	
Sep-91		8.90	1032.18	1042.2	
Feb-92		13.21	1035.2	1047.7	
Apr-92		10.01	1032.96	1047.7	
Jun-92		10.61	1033.38	1047.7	
Sep-92		9.21	1032.4	1047.7	
May-94		8.60	1031.97	1047.7	
Sep-94		7.40	1031.13	1047.7	
Sep-95		9.00	1032.25	1047.7	
Sep-96		8.1	1031.62	1048.1	
7-May-97		5.1	1029.52		
17-Oct-97		9.36	1032.502		
27-May-98		9.49	1032.593	1048.1	
12-Nov-98		7.56	1031.242	1047.8	
16-Dec-98		7.6	1031.27	1047.8	
29-May-99		9.60	1032.67	1048	
16-Sep-99		6.6	1030.57	1047.7	
14-Jun-00		8.9	1032.18	1047.6	
9-Sep-00		7.5	1031.2		
10-Jun-01		8.20	1031.69		
20-Sep-01		8.10	1031.62		
18-Jun-02		8.30	1031.76		
10-Sep-02		7.70	1031.34		
4-Nov-02		7.50	1031.2		
10-Nov-02		7.40	1031.13		
11-Jun-03		7.70	1031.34		*New piezometer started use here
10-Sep-03		6.20	1030.29		
10-May-04		7.20	1030.99		2004 survey data used from here on
19-Jul-04		7.40	1031.13		
9-Sep-04		6.90	1030.78		
26-May-05		6.1	1030.22		
14-Sep-05		5.1	1029.52		
09-Mar-06		4.6	1029.17		
27-Mar-06		4.8	1029.31		
14-Jun-06		5.4	1029.73		
02-Oct-06		4.9	1029.38		
22-May-07		6.3	1030.36	1046.781	Good Flow
26-Sep-07		5.5	1029.8		

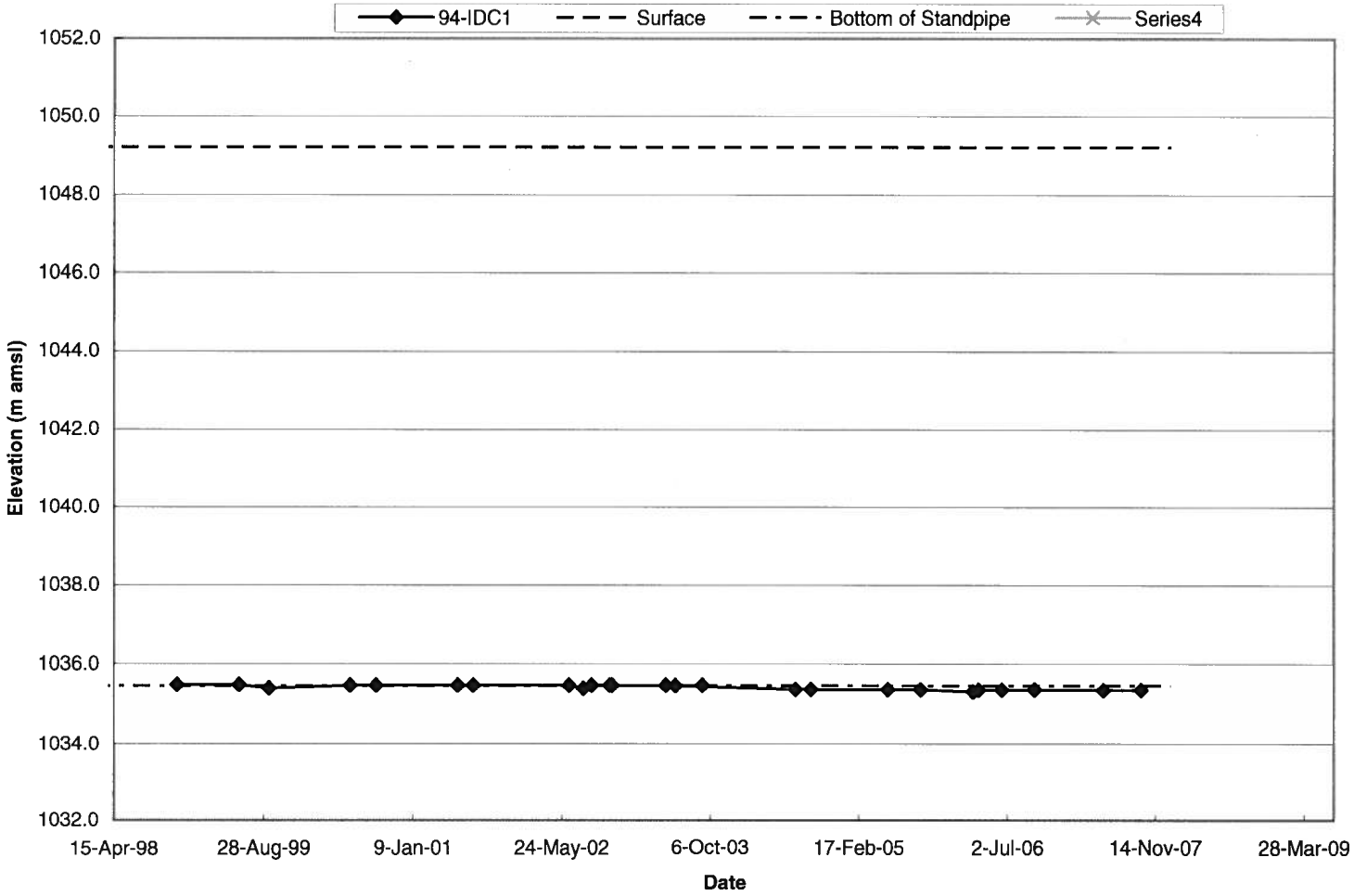
INTERMEDIATE DAM
Piezometric Monitoring
BH91-ID7 Pneumatic Piezometer
(Toe of Dam)

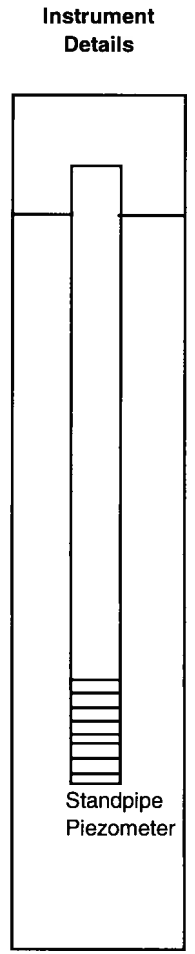


Faro Mine Instrumentation - Intermediate Dam

BH94-IDC-1		Location:	Intermediate Dam Crest	2004 Stick Up (m):	0.27
		Coordinates:	8V580605 6913969	2004 Surface Elevation (m amsl):	1049.21
Surface Protector:	Yes	Date Installed:	1994	Tip Elevation:	N/A
Date		Water level from top of pipe (m)	Piezometric Elevation (m amsl)	Pond El. (m amsl)	Comments
2-Jun-94				1047.7	dry
16-Sep-94				1047.7	dry
22-Sep-95				1047.7	dry
25-Sep-96				1048.1	dry
28-May-98				1048.1	dry
13-Nov-98		14.10	1035.48	1047.8	dry
8-Jun-99		14.10	1035.48	1047.8	dry
16-Sep-99		14.18	1035.40	1047.7	dry
14-Jun-00		14.11	1035.47	1047.6	dry
9-Sep-00		14.11	1035.47	1047.6	H2O
10-Jun-01		14.11	1035.47	1047.6	
1-Aug-01		14.11	1035.47	1047.6	dry
18-Jun-02		14.11	1035.47		dry
5-Aug-02		14.19	1035.40		dry
2-Sep-02		14.11	1035.47		dry
2-Nov-02		14.11	1035.47		dry
10-Nov-02		14.11	1035.47		dry
11-Jun-03		14.12	1035.46		dry
10-Sep-03		14.11	1035.47		dry
10-May-03		14.11	1035.47		dry
19-Jul-04		14.11	1035.37		dry
9-Sep-04		14.11	1035.37		dry
26-May-05		14.12	1035.36		bottom
14-Sep-05		14.12	1035.36		bottom
09-Mar-06		14.17	1035.31		
27-Mar-06		14.13	1035.35		no beep, ice crystals
14-Jun-06		14.125	1035.355		bottom
02-Oct-06		14.12	1035.36		
22-May-07		14.135	1035.345	1046.781	bottom and beep
26-Sep-07		14.125	1035.355		no beep

INTERMEDIATE DAM
Piezometric Monitoring
BH94-IDC-1 Standpipe Piezometer
Crest of Dam



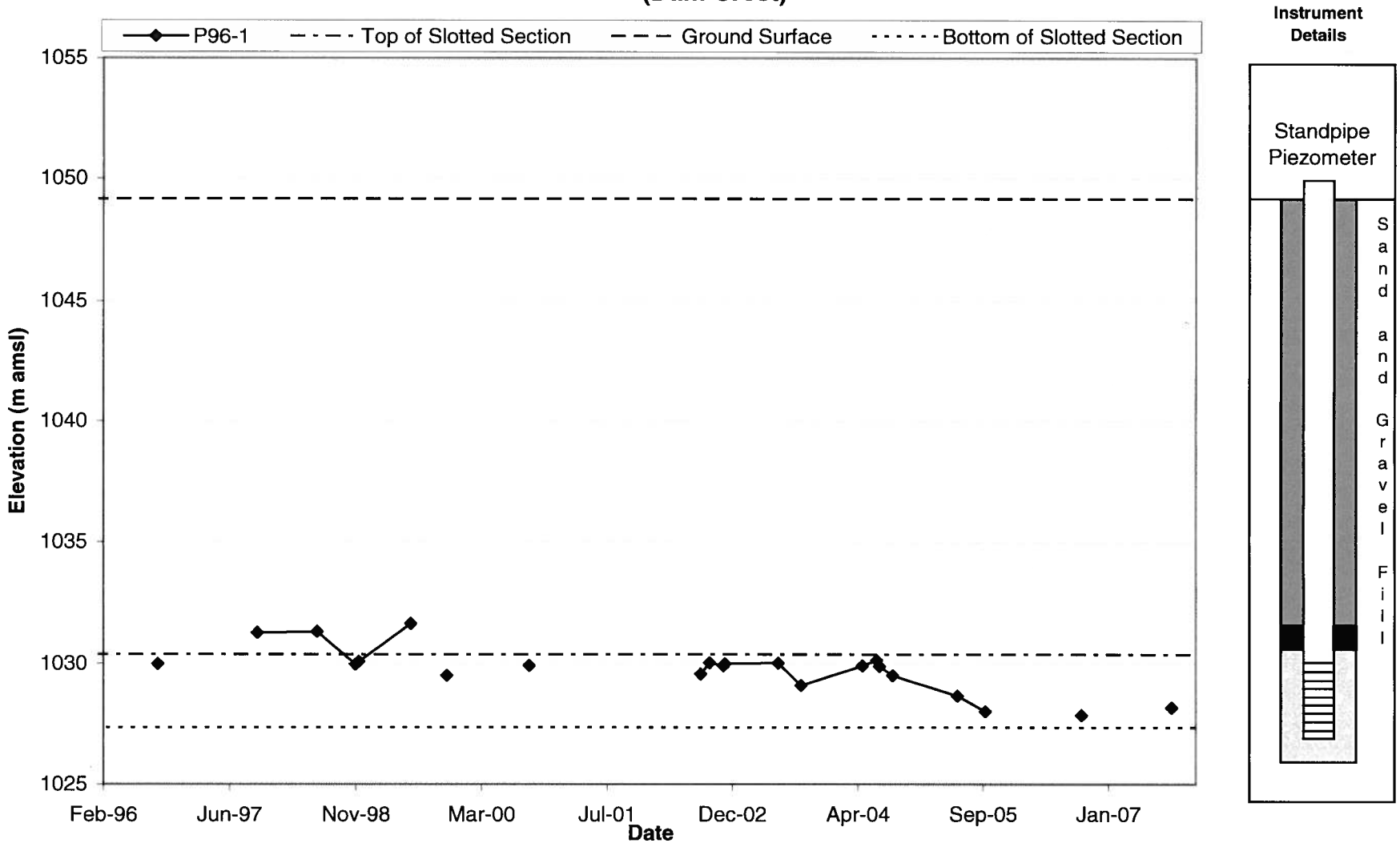


Faro Mine Instrumentation - Intermediate Dam

BH96-1		Location:	Intermediate Dam Crest		
		Coordinates:	8V580563 6913908	2004 Stick Up:	0.68
Surface Protector:	yes	Date Installed:	1996	2004 Surface Elevation (m amsl):	1049.15
		Screened Interval (m bgs):	18.77 - 21.80	Tip Elevation (m amsl):	1027.35

Date		Water level from top of pipe (m)		Piezometric Elevation (m amsl)	Comments
8-Sep-96		20.06		1029.99	
26-Sep-96					
27-Sep-96					
13-May-97					
6-Jun-97					
11-Jul-97					
7-Oct-97		18.77		1031.28	
1-Jun-98		18.73		1031.32	
31-Oct-98		20.08		1029.97	
13-Nov-98		19.97		1030.08	
8-Jun-99		18.4		1031.65	
19-Jun-99					
3-Jul-99					
29-Oct-99		20.55		1029.50	
31-Oct-99					
31-May-00					
27-Jun-00					
25-Jul-00					
21-Sep-00		20.13		1029.92	
10-Oct-00					
6-Jun-01					
15-Jul-01					
5-Sep-01					
18-Jun-02					
5-Aug-02		20.48		1029.57	
10-Sep-02		20.02		1030.03	
4-Nov-02		20.14		1029.91	
10-Nov-02		20.06		1029.99	
11-Jun-03		20.025		1030.03	
10-Sep-03		20.96		1029.09	
12-May-04		19.925		1029.91	2004 survey data used from here on
8-Jul-04		19.695		1030.14	
19-Jul-04		19.945		1029.89	
9-Sep-04		20.325		1029.51	clear
26-May-05		21.17		1028.66	ICE
14-Sep-05		21.82		1028.01	
09-Mar-06					
27-Mar-06					no read, frozen
14-Jun-06		2.27			likely a mistake
02-Oct-06		21.98		1027.85	
22-May-07					no read, frozen
26-Sep-07		21.655		1028.18	

INTERMEDIATE DAM
Piezometric Monitoring
P96-1 Monitoring Well (Robertson, 1996)
(Dam Crest)

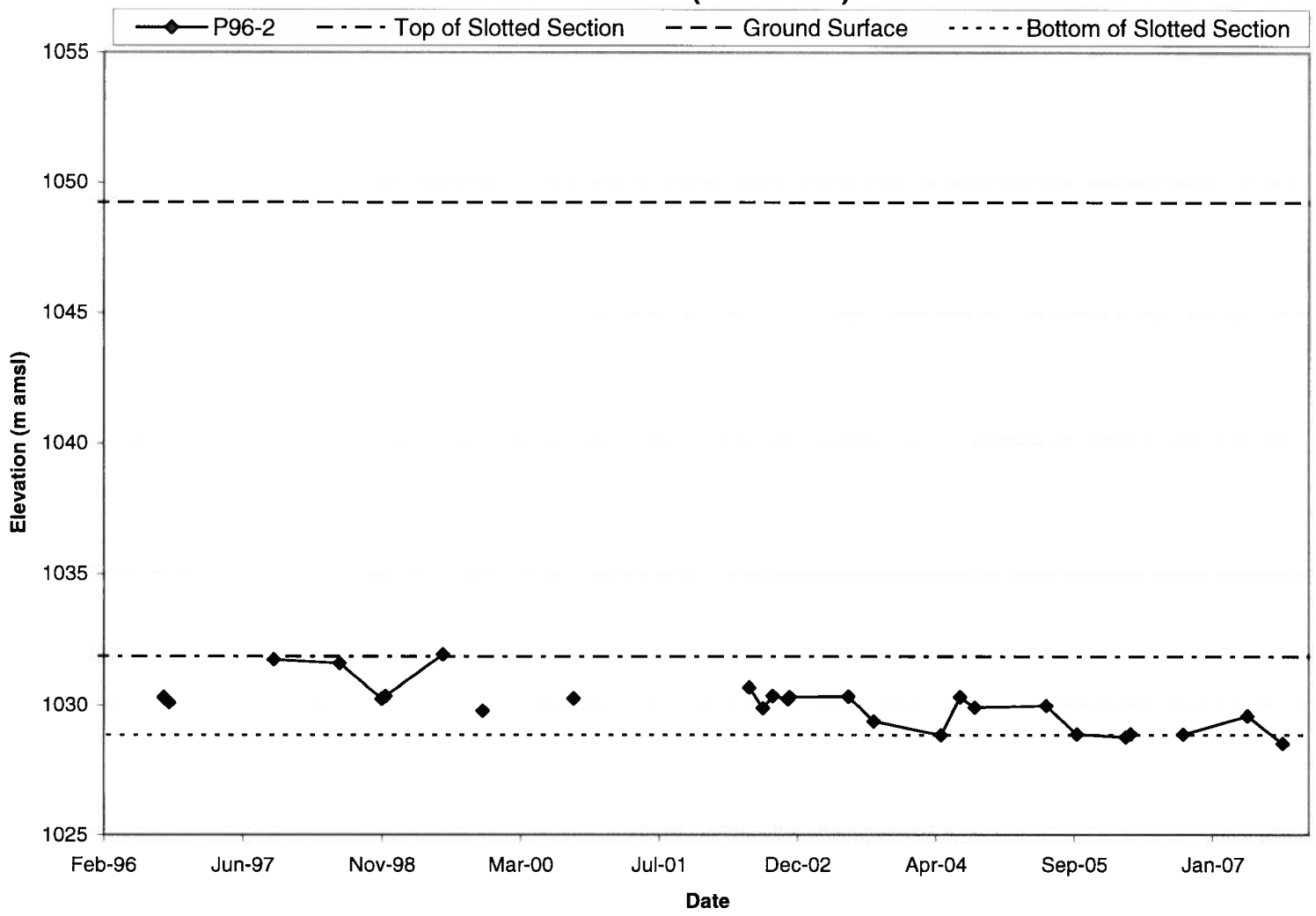


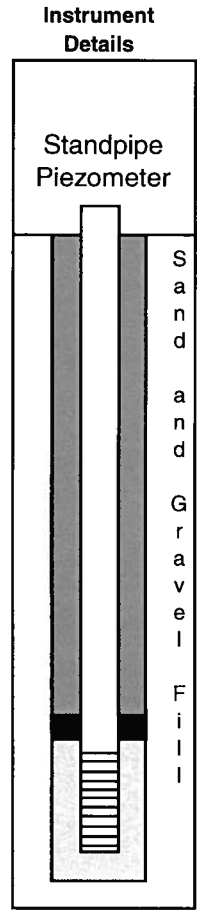
Faro Mine Instrumentation - Intermediate Dam

BH96-2		Location:	Intermediate Dam Crest		
		Coordinates:	8V580696 6914096	Tip Elevation (m amsl):	1028.87
Surface Protector:	yes	Date Installed:	1996	2004 Surface Elevation: (m amsl)	1049.22
		Screened Interval (m bgs):	17.13 - 20.12	2004 Stick Up (m):	0.72

Date		Water level from top of pipe (m)		Piezometric Elevation (m amsl)	Comments
8-Sep-96		19.74		1030.31	
26-Sep-96					
27-Sep-96		19.94		1030.11	
13-May-97					
6-Jun-97					
11-Jul-97					
7-Oct-97		18.3		1031.75	
1-Jun-98		18.44		1031.61	
31-Oct-98		19.8		1030.25	
13-Nov-98		19.69		1030.36	
8-Jun-99		18.11		1031.94	
19-Jun-99					
3-Jul-99					
29-Oct-99		20.25		1029.80	
31-Oct-99					
31-May-00					
27-Jun-00					
25-Jul-00					
21-Sep-00		19.78		1030.27	
10-Oct-00					
6-Jun-01					
15-Jul-01					
5-Sep-01					
18-Jun-02		19.375		1030.68	
5-Aug-02		20.15		1029.90	
10-Sep-02		19.68		1030.37	
4-Nov-02		19.815		1030.24	
10-Nov-02		19.73		1030.32	
11-Jun-03		19.71		1030.34	
10-Sep-03		20.65		1029.40	
10-May-04		21.07		1028.87	Dry reading, 2004 survey data used from here on
19-Jul-04		19.615		1030.33	
9-Sep-04		20.02		1029.92	
26-May-05		19.95		1029.99	
14-Sep-05		21.04		1028.90	bottom iron mud on probe
09-Mar-06		21.15		1028.79	
27-Mar-06		21.03		1028.91	no beep, mud on probe
14-Jun-06		13.05			
02-Oct-06		21.04		1028.90	
22-May-07		20.34		1029.60	no beep, dry
26-Sep-07		21.4		1028.54	

Intermediate Dam
Piezometric Monitoring
P96-2 Monitoring Well (Robertson, 1996)
(Dam Crest)



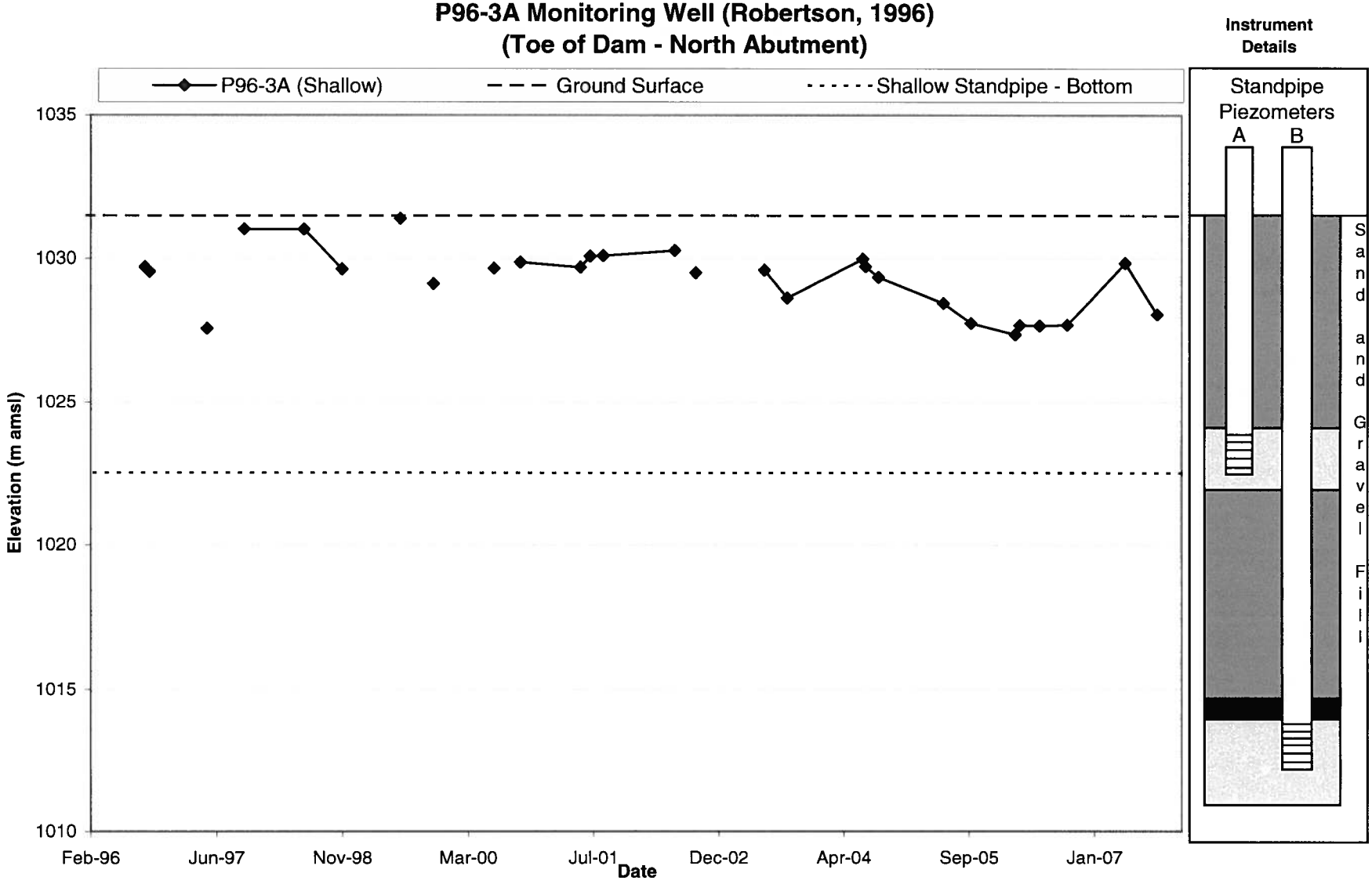


Faro Mine Instrumentation - Intermediate Dam

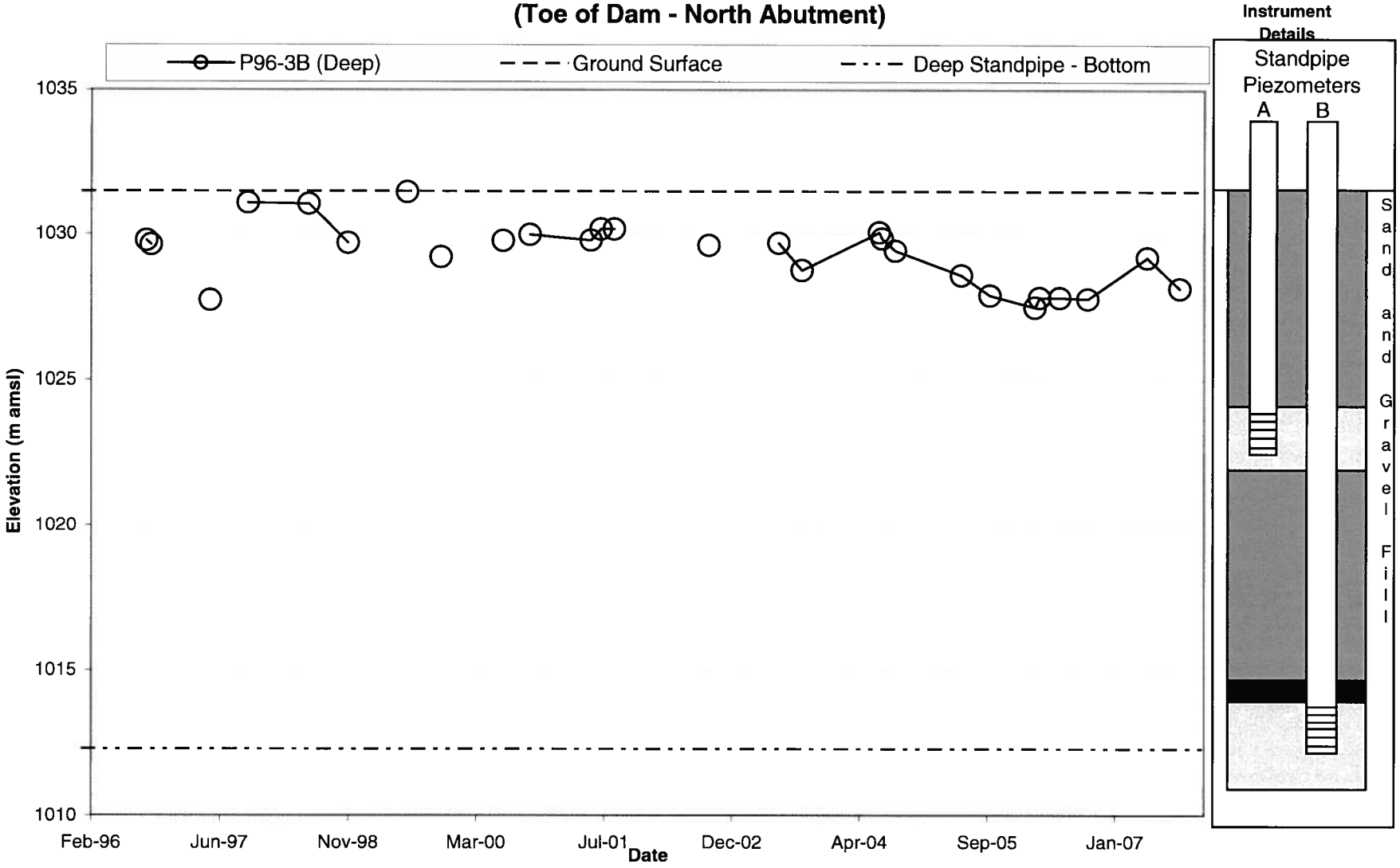
BH96-3		Location:	Intermediate Dam Toe, near the North Abutment	2004 Stick Up - A (m):	0.65
		Coordinates:	8V580529 6913934	2004 Stick Up - B (m):	0.59
Surface Protector:	yes	Date Installed:	1996	2004 Surface Elevation (m amsl):	1031.48
		Tip Elevation - A (m amsl):	1022.43	Screened Interval - A (m bgs):	7.44 - 8.97
		Tip Elevation - B (m amsl):	1012.23	Screened Interval - B (m bgs):	17.7 - 19.17

Date	Water level from top of pipe (m)		Piezometric Elevation (m amsl)		Comments
	A	B	96-3A (Shallow)	96-3B (Deep)	
08-Sep-96	2.37	2.25	1029.71	1029.78	
26-Sep-96	2.53	2.4	1029.55	1029.63	
27-Sep-96					
13-May-97	4.5	4.32	1027.58	1027.71	
06-Jun-97					
11-Jul-97					
07-Oct-97	1.06	0.95	1031.02	1031.08	
01-Jun-98	1.07	0.99	1031.01	1031.04	
31-Oct-98	2.44	2.34	1029.64	1029.69	
13-Nov-98					
08-Jun-99					
19-Jun-99	0.7	0.58	1031.38	1031.45	
03-Jul-99					
29-Oct-99	2.94	2.82	1029.14	1029.21	
31-Oct-99					
31-May-00					
27-Jun-00	2.41	2.26	1029.67	1029.77	
25-Jul-00					
21-Sep-00					
10-Oct-00	2.2	2.05	1029.88	1029.98	
06-Jun-01	2.38	2.24	1029.70	1029.79	
15-Jul-01	2.00	1.86	1030.08	1030.17	
05-Sep-01	1.98	1.86	1030.10	1030.17	
18-Jun-02	1.81		1030.27		
05-Aug-02					
10-Sep-02	2.565	2.42	1029.52	1029.61	
04-Nov-02					
10-Nov-02					
11-Jun-03	2.47	2.34	1029.61	1029.69	
10-Sep-03	3.43	3.28	1028.65	1028.75	
08-Jul-04	2.15	2.01	1029.98	1030.06	2004 survey data used from here on
19-Jul-04	2.4	2.225	1029.73	1029.85	
09-Sep-04	2.77	2.645	1029.36	1029.43	clear, sulphur smell
26-May-05	3.66	3.49	1028.47	1028.58	
14-Sep-05	4.365	4.18	1027.77	1027.89	
09-Mar-06	4.76	4.59	1027.37	1027.48	
27-Mar-06	4.43	4.26	1027.70	1027.81	
14-Jun-06	4.45	4.26	1027.68	1027.81	
2-Oct-06	4.42	4.3	1027.71	1027.77	
22-May-07	2.29	2.88	1029.84	1029.19	a- frozen no beep
26-Sep-07	4.06	3.94	1028.07	1028.13	

INTERMEDIATE DAM
Piezometric Monitoring
P96-3A Monitoring Well (Robertson, 1996)
(Toe of Dam - North Abutment)



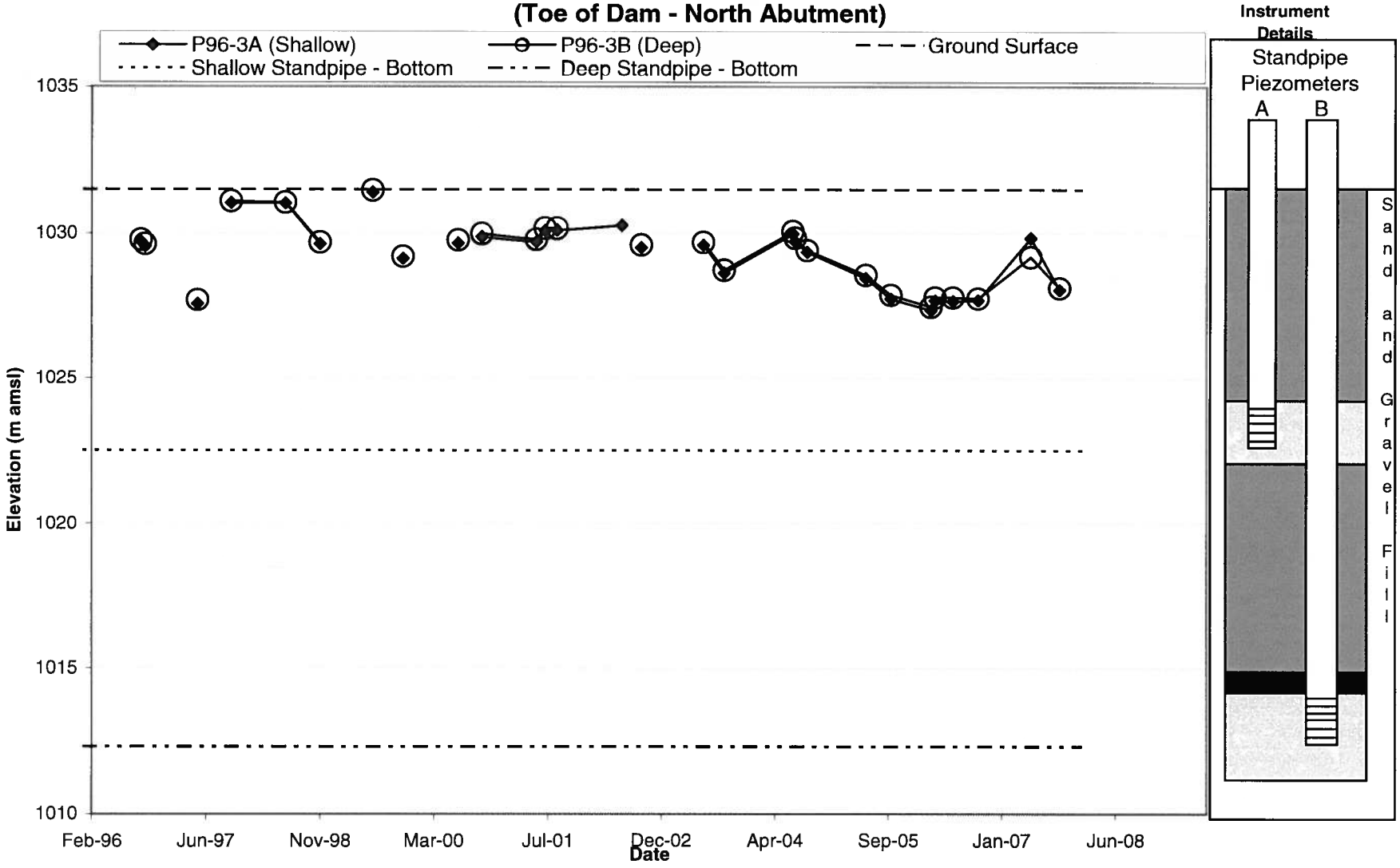
INTERMEDIATE DAM
Piezometric Monitoring
P96-3B Monitoring Well (Robertson, 1996)
(Toe of Dam - North Abutment)



IDpiezo_updated_2007
96-3 chrt (B)

BGC Engineering Inc.

INTERMEDIATE DAM
Piezometric Monitoring
P96-3 Monitoring Well (Robertson, 1996)
(Toe of Dam - North Abutment)

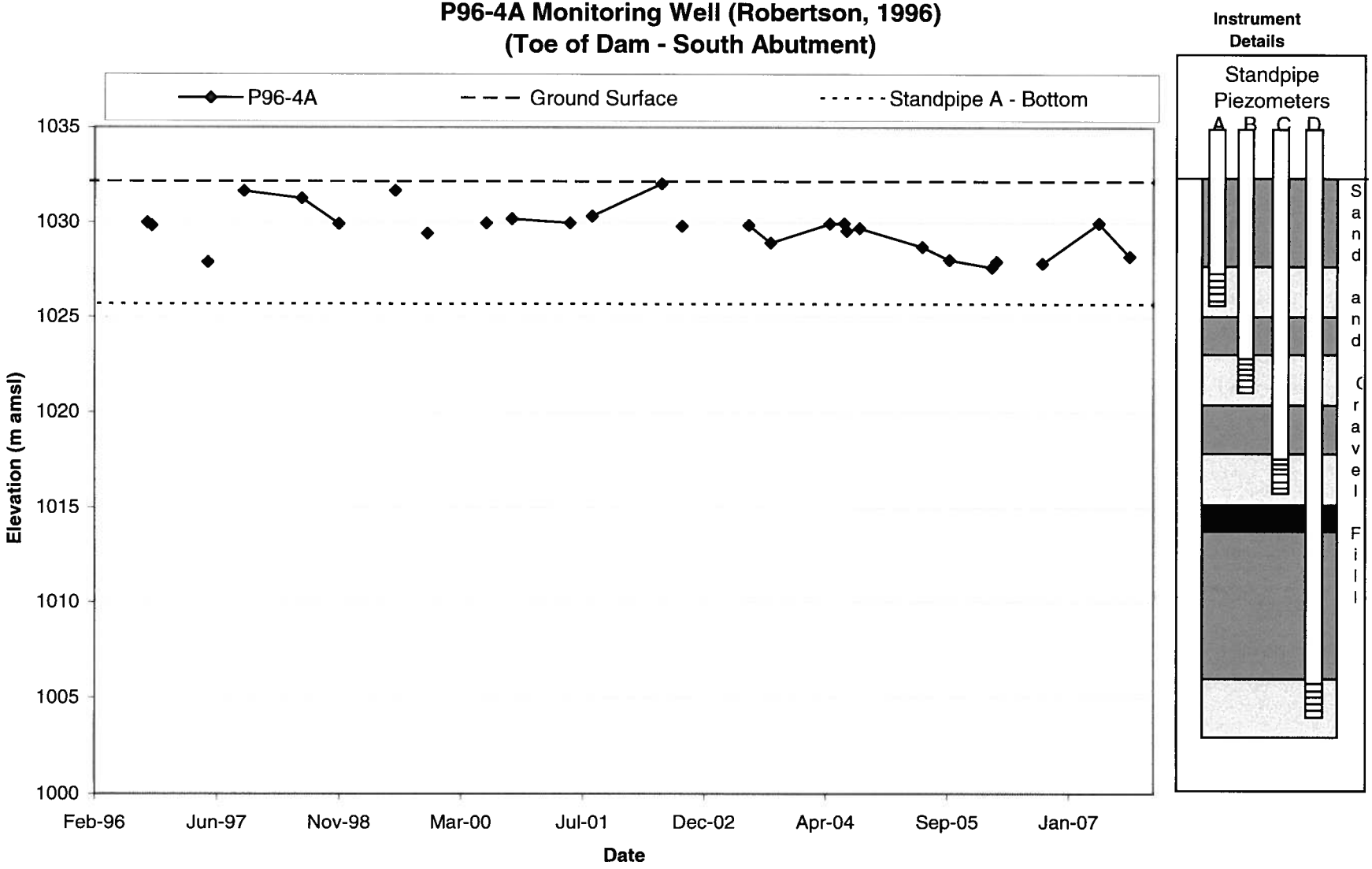


Faro Mine Instrumentation - Intermediate Dam

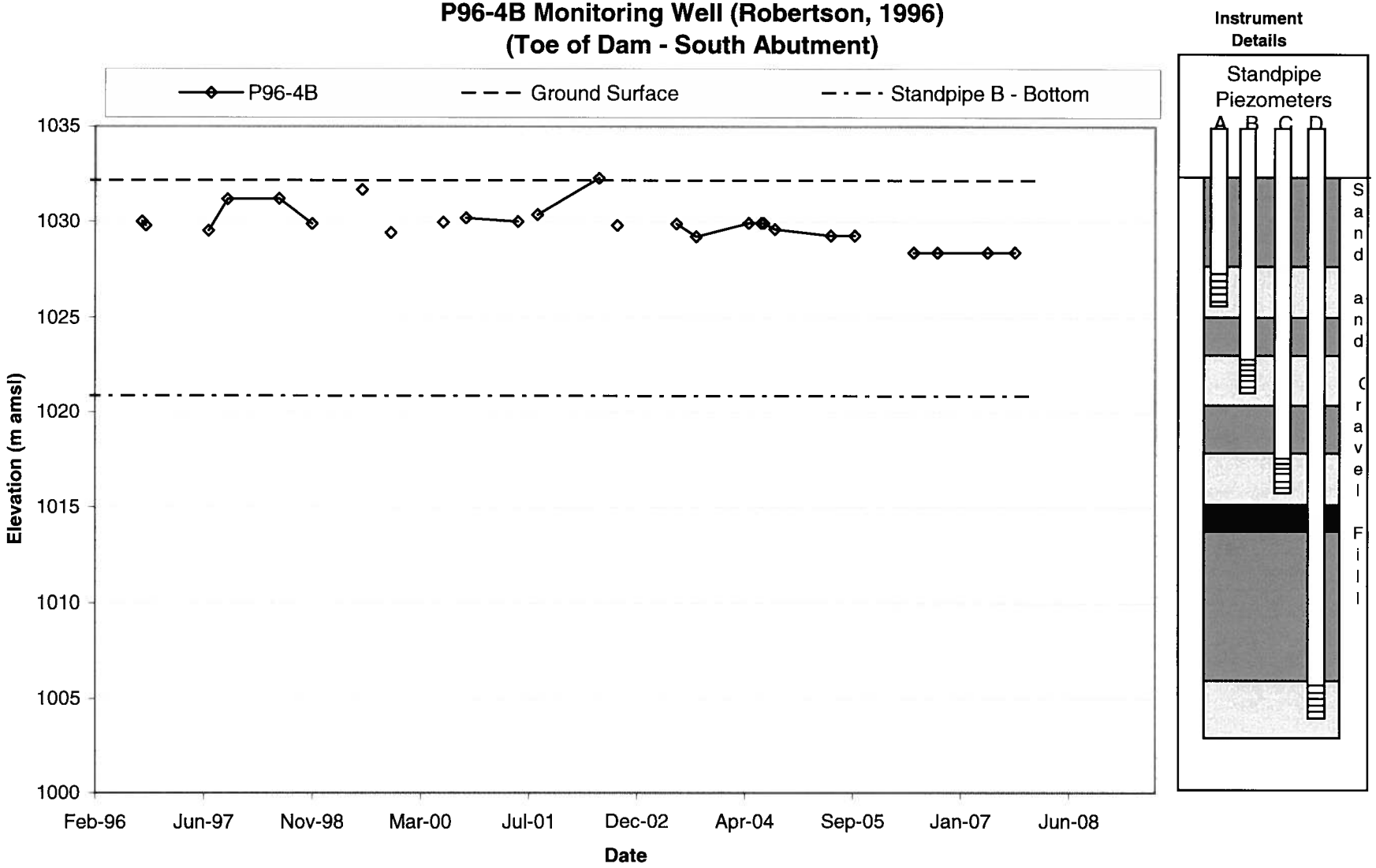
BH96-4		Location:	Intermediate Dam Toe, near South Abutment	2004 Stick Up - A (m):	0.95
		Coordinates:	8V580669 6914113	2004 Stick Up - B (m):	0.87
Surface Protector:	N/A	Date Installed:	1996	2004 Stick Up - C (m):	0.91
Screened Interval - A (m bgs):	5.7-6.48	Screened Interval - C (m bgs):	14.97-16.47	2004 Stick Up - D (m):	0.88
Screened Interval - B (m bgs):	9.8-11.3	Screened Interval - D (m bgs):	26.84-28.34	2004 Surface Elevation (m amsl):	1032.16

Date	Water level from top of pipe (m)				Piezometric Elevation (m amsl)				Comments
	A	B	C	D	A	B	C	D	
08-Sep-96	3.11	3.04	2.98	2.88	1029.99	1030.01	1030.02	1030.12	
26-Sep-96	3.27	3.25	3.12	3.05	1029.83	1029.80	1029.88	1029.95	
27-Sep-96									
13-May-97	5.21		4.85		1027.89		1028.15		
06-Jun-97									
11-Jul-97		3.51				1029.54			
07-Oct-97	1.45	1.87	1.82		1031.65	1031.18	1031.18		
01-Jun-98	1.84	1.84	1.83	1.62	1031.26	1031.21	1031.17	1031.38	
31-Oct-98	3.18	3.15	3.09	3.01	1029.92	1029.90	1029.91	1029.99	
13-Nov-98									
08-Jun-99									
19-Jun-99	1.43	1.38	1.36	1.25	1031.67	1031.67	1031.64	1031.75	
03-Jul-99									
29-Oct-99	3.68	3.62	3.60	3.48	1029.42	1029.43	1029.40	1029.52	
31-Oct-99									
31-May-00									
27-Jun-00	3.14	3.08	3.07	2.93	1029.96	1029.97	1029.93	1030.07	
25-Jul-00			2.84				1030.16		
21-Sep-00									
10-Oct-00	2.92	2.85	2.83	2.71	1030.18	1030.20	1030.17	1030.29	
06-Jun-01	3.13	3.04	3.06	2.94	1029.97	1030.01	1029.94	1030.06	
15-Jul-01									
05-Sep-01	2.77	2.68	2.71	2.57	1030.33	1030.37	1030.29	1030.43	
18-Jun-02	1.06	0.77			1032.04	1032.28			
05-Aug-02									
10-Sep-02	3.31	3.24	3.25	3.11	1029.80	1029.82	1029.75	1029.90	
04-Nov-02									
10-Nov-02									
11-Jun-03	3.24	3.15	3.21	3.06	1029.86	1029.90	1029.79	1029.94	
10-Sep-03	4.19	3.82	4.15	3.99	1028.91	1029.23	1028.85	1029.01	
10-May-04	3.18	3.10	3.14	3.01	1029.93	1029.94	1029.93	1030.03	2004 survey info used from here on
08-Jul-04	3.16	3.09	3.12	2.99	1029.95	1029.94	1029.96	1030.06	
19-Jul-04	3.56	3.09	3.12	2.99	1029.55	1029.94	1029.96	1030.06	
09-Sep-04	3.41	3.41	3.50	3.38	1029.70	1029.62	1029.57	1029.67	a, b and c - dirty; d - clear; a and d - sulphur smell
26-May-05	4.415	3.74		4.22	1028.70	1029.29		1028.83	coarse sand frozen
14-Sep-05	5.1	3.75	5.25	4.89	1028.01	1029.28	1027.82	1028.15	b- bottom blocked
09-Mar-06	5.50	blocked	5.33	5.31	1027.61		1027.74	1027.73	b- bottom blocked
27-Mar-06	5.19	blocked	5.12	4.99	1027.92		1027.96	1028.05	b- bottom blocked, ice crystals on probe
14-Jun-06	2.66	3.75	0.40	4.98		1028.41		1028.06	b-bottom. C-bottom fine sand
02-Oct-06	5.28	3.75	5.20	5.07	1027.83	1028.41	1027.87	1027.97	
22-May-07	3.15	3.75	1.52	3.11	1029.96	1028.41	1031.55	1029.93	a, b and d- frozen no beep
26-Sep-07	4.92	3.74	4.84	4.71	1028.20	1028.42	1028.23	1028.34	b: Bottom

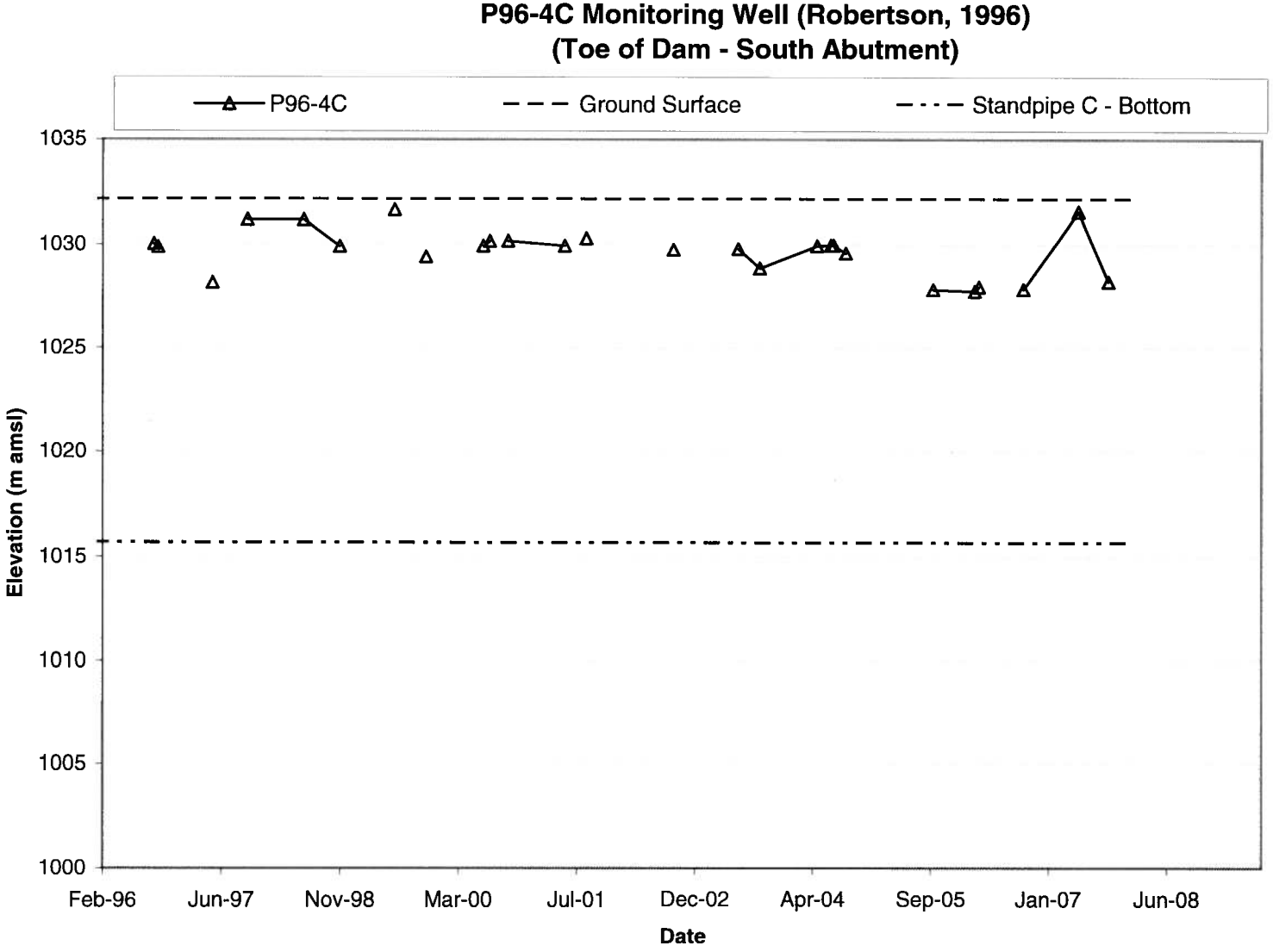
INTERMEDIATE DAM
Piezometric Monitoring
P96-4A Monitoring Well (Robertson, 1996)
(Toe of Dam - South Abutment)

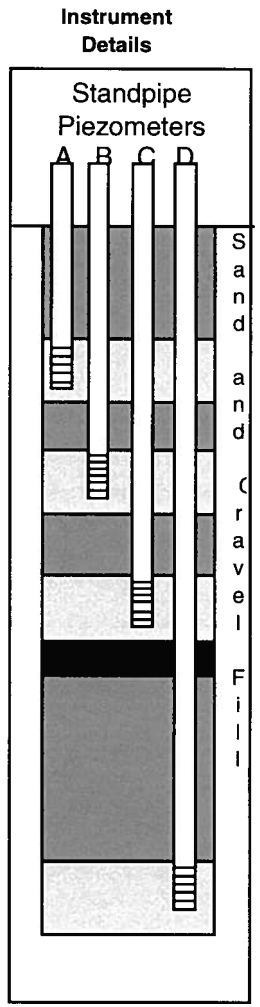


INTERMEDIATE DAM
Piezometric Monitoring
P96-4B Monitoring Well (Robertson, 1996)
(Toe of Dam - South Abutment)

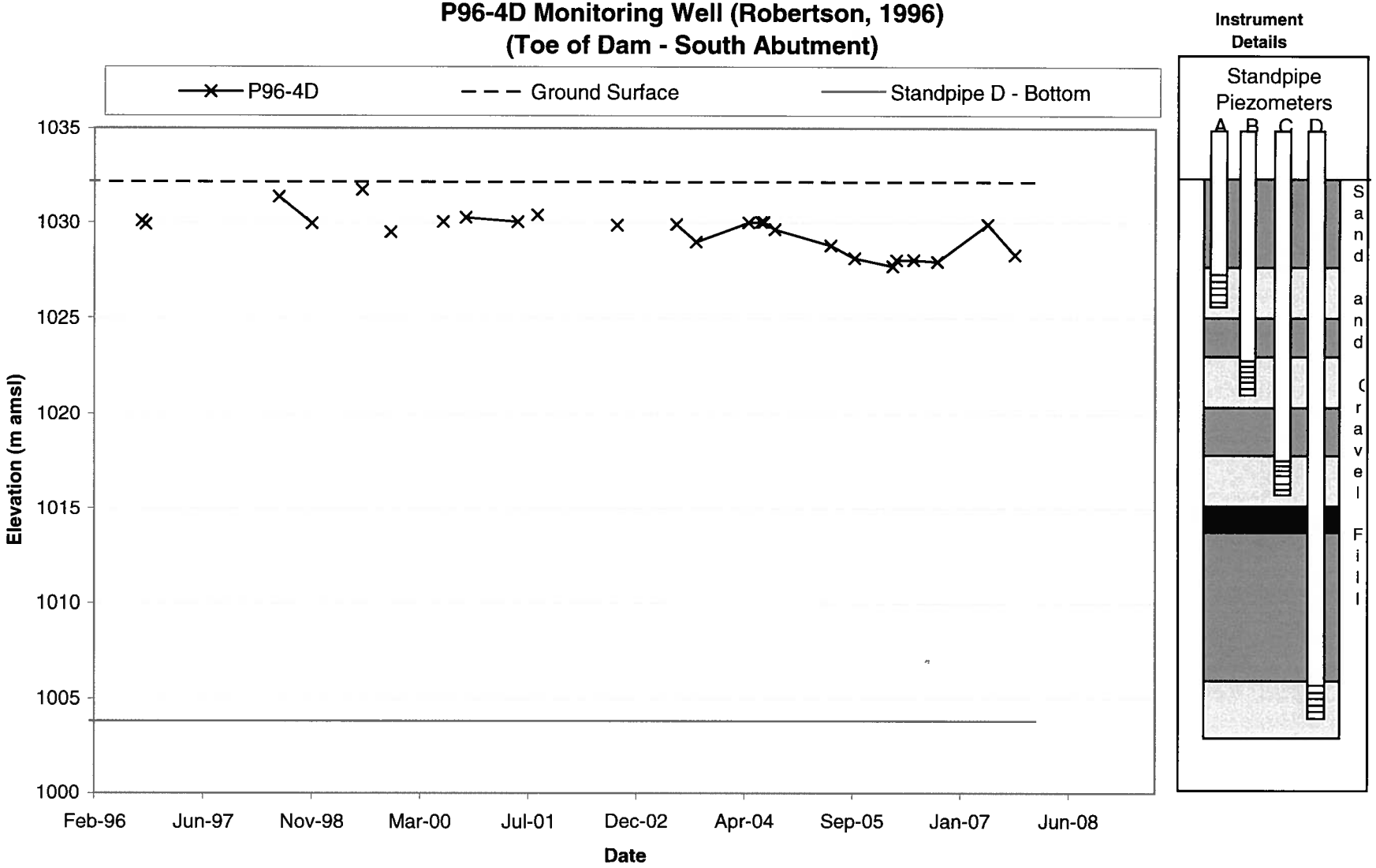


INTERMEDIATE DAM
Piezometric Monitoring
P96-4C Monitoring Well (Robertson, 1996)
(Toe of Dam - South Abutment)

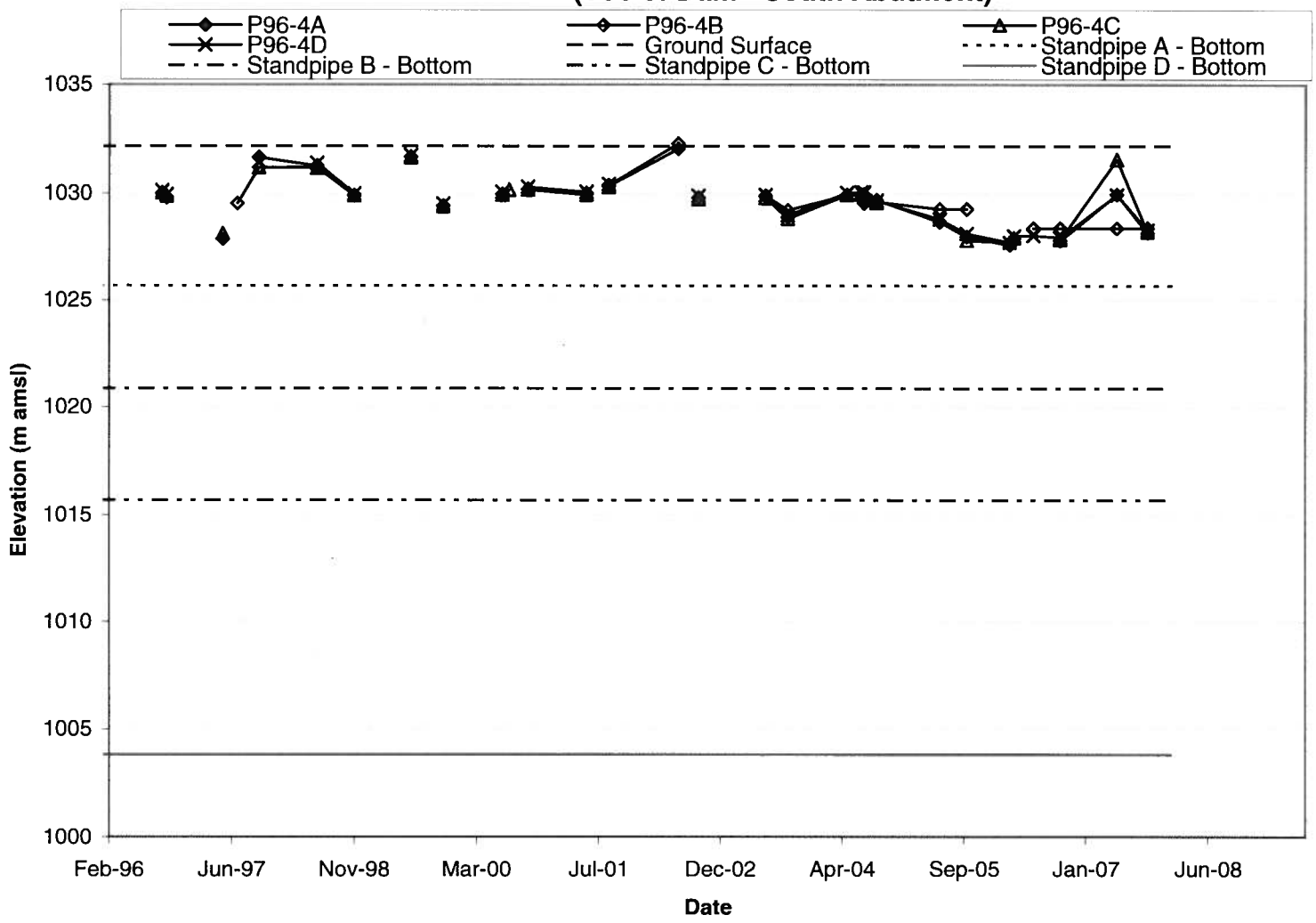


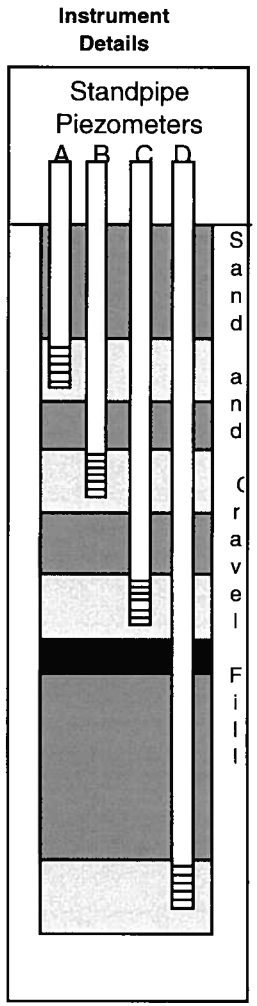


INTERMEDIATE DAM
Piezometric Monitoring
P96-4D Monitoring Well (Robertson, 1996)
(Toe of Dam - South Abutment)



INTERMEDIATE DAM
Piezometric Monitoring
P96-4 Monitoring Well (Robertson, 1996)
(Toe of Dam - South Abutment)



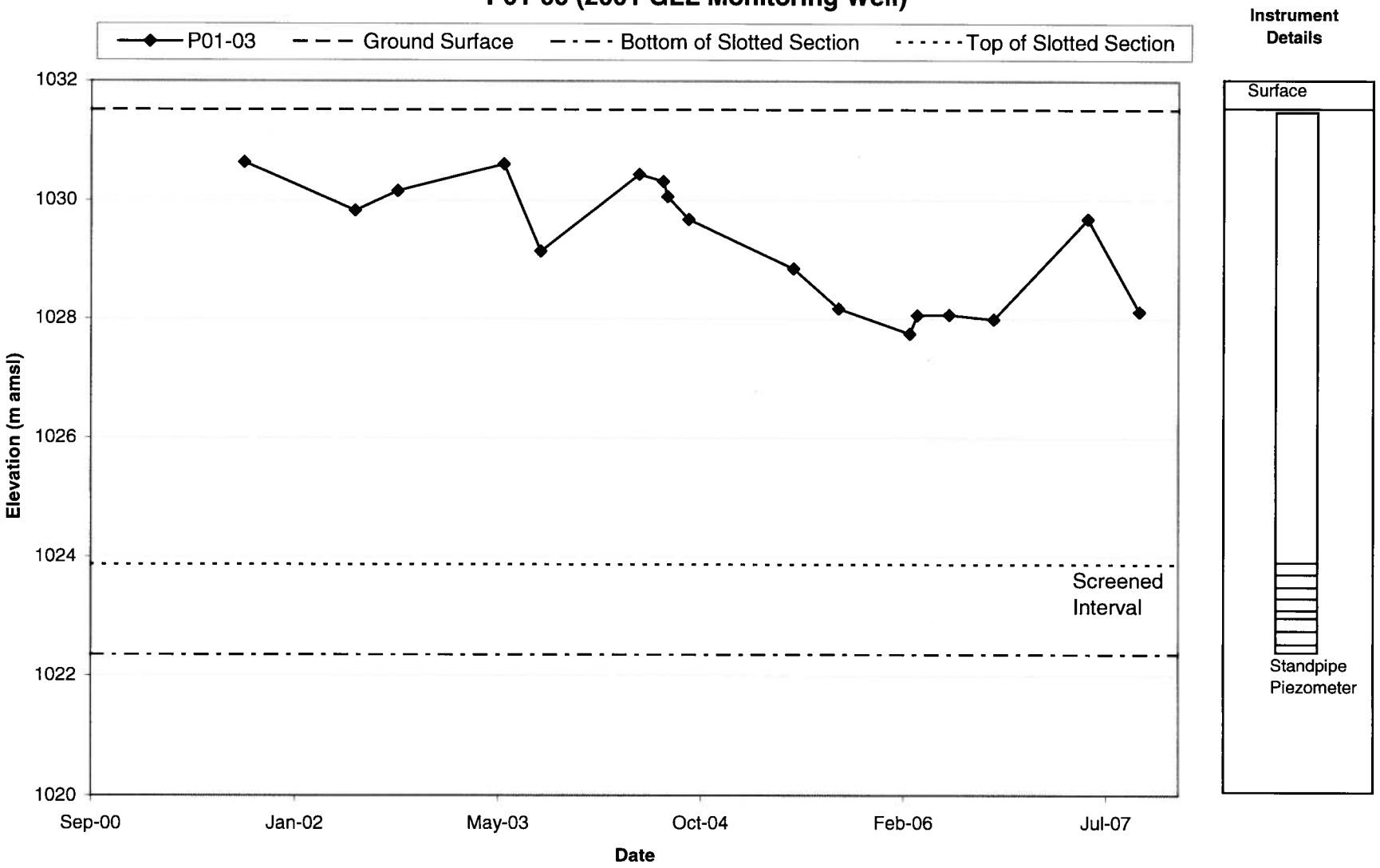


Faro Mine Instrumentation Intermediate Dam

P01-03		Location:	Intermediate Dam Toe	2004 Stick-Up (m):	0.61
		Coordinates:	8V580636 6914064	2004 Surface Elevation (m amsl):	1031.52
Surface Protector:	yes	Date Installed:	1996	Tip Elevation (m amsl):	1022.35
				Screened Interval (m bgs):	7.78 - 9.30

Date		Water level from top of pipe (m)	Piezometric Elevation (m amsl)	Pond El. (m amsl)	Comments
11-Sep-01		1.58	1030.63		
10-Jun-02		2.39	1029.82		
23-Sep-02		2.06	1030.15	1047.2	
11-Jun-03		1.61	1030.60		
10-Sep-03		3.075	1029.14		
10-May-04		1.7	1030.43		2004 survey info used from here on
08-Jul-04		1.82	1030.31		
19-Jul-04		2.07	1030.06		
09-Sep-04		2.455	1029.68		Dirty, strong sulphur smell
26-May-05		3.285	1028.85		ph=6.7, temp=9.0C
14-Sep-05		3.96	1028.17		ph=6.8, temp=6.4C
09-Mar-06		4.38	1027.75		
27-Mar-06		4.07	1028.06		
14-Jun-06		4.06	1028.07		
02-Oct-06		4.14	1027.99		
22-May-07		2.445	1029.69	1046.781	Frozen no beep
26-Sep-07		4.01	1028.12	1047.781	

INTERMEDIATE DAM
Piezometric Monitoring
P01-03 (2001 GLL Monitoring Well)

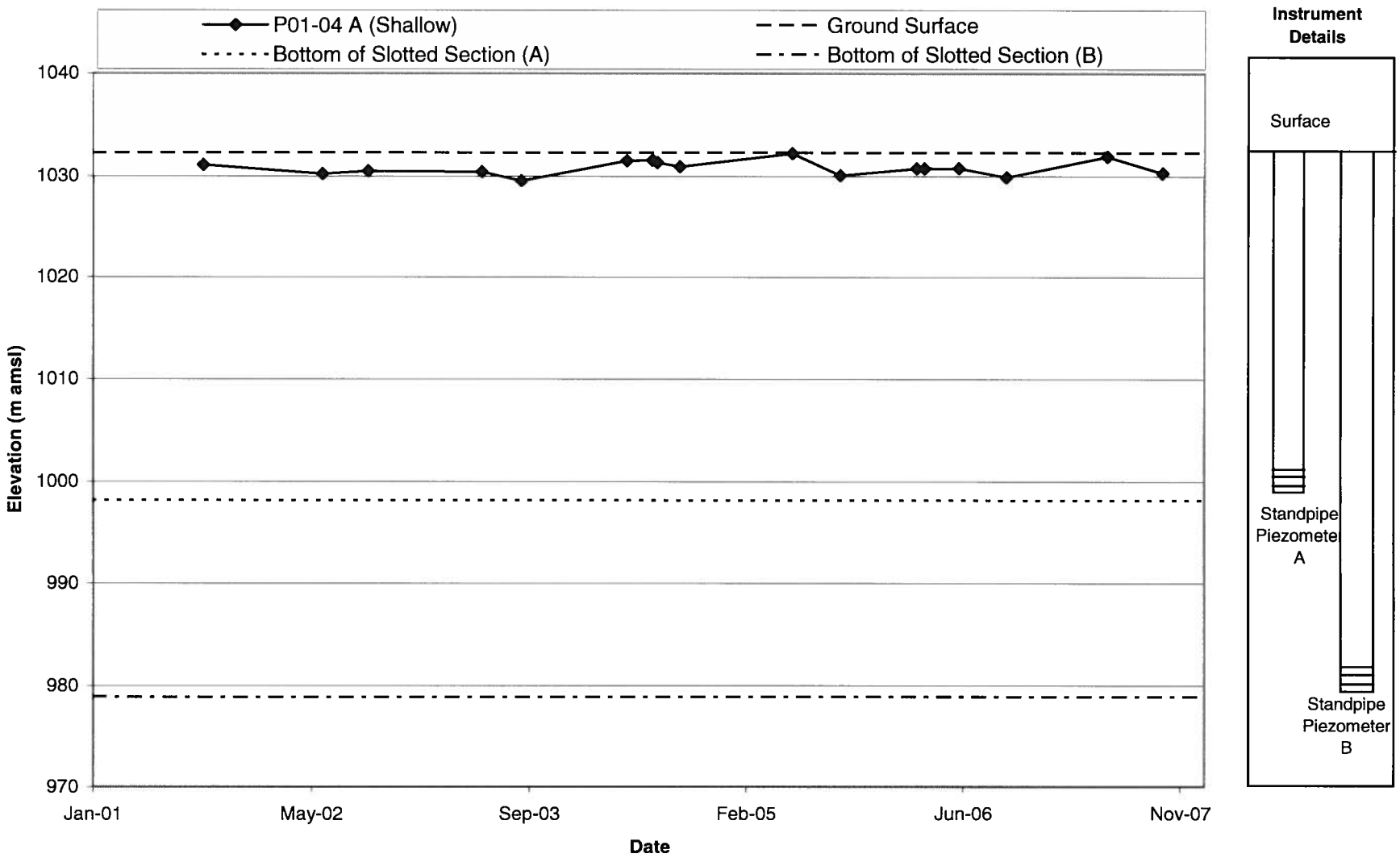


Faro Mine Instrumentation - Intermediate Dam

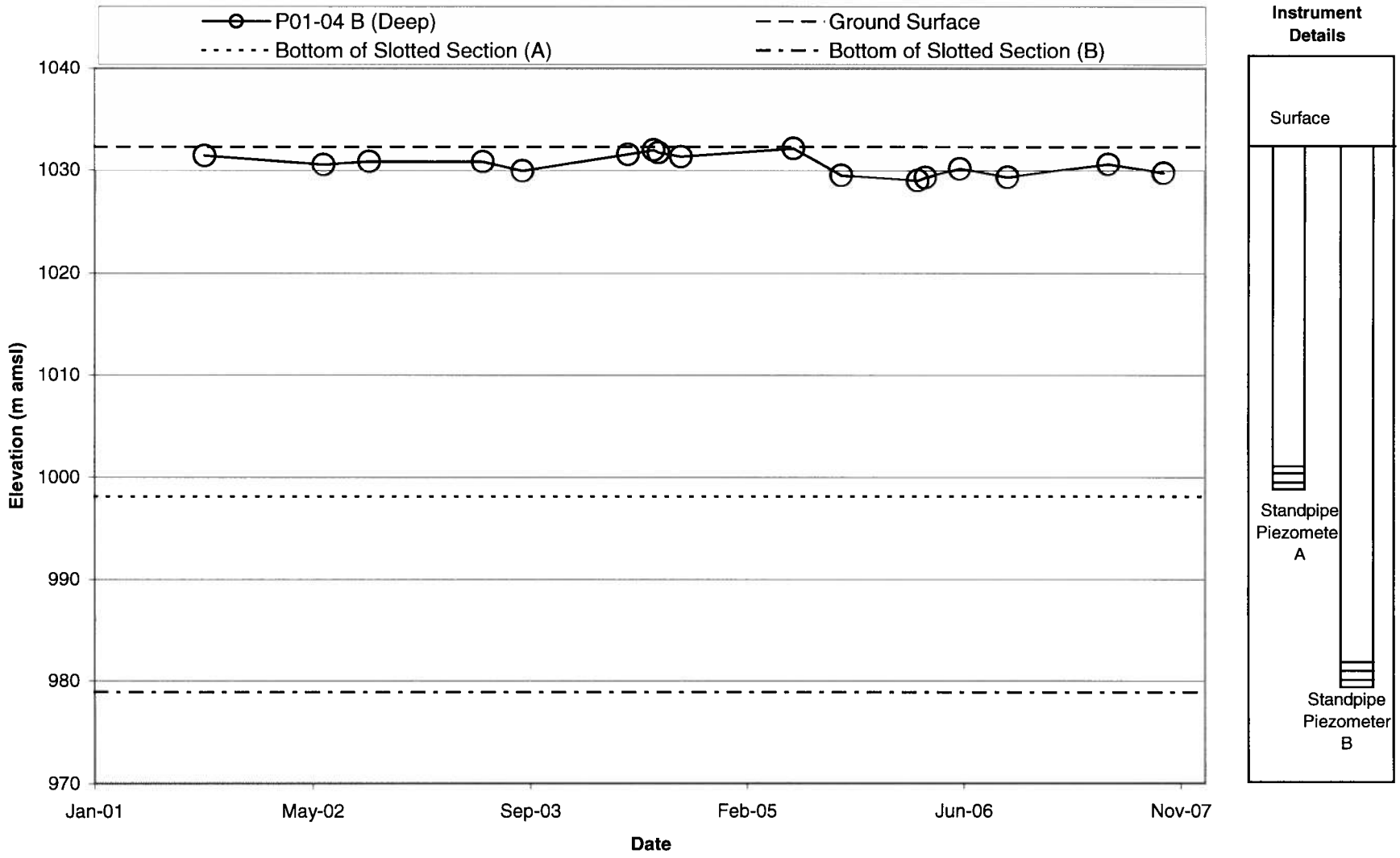
P01-04		Location:	Intermediate Dam Toe	2004 Stick Up - A (m):	0.45
		Coordinates:	8V580489 6913888	2004 Stick Up -B (m):	0.45
Surface Protector:	yes	Date Installed:	1996	2004 Surface Elevation (m amsl):	1032.32
		Screened Interval -A (m bgs):	31.7 - 33.22	Tip Elevation - A (m amsl):	998.17
		Screened Interval - B (m bgs):	51.0 - 52.5	Tip Elevation - B (m amsl):	978.89

Date	Water level from top of pipe (m)		Piezometric Elevation (m amsl)		Comments
	A	B	A	B	
11-Sep-01	0.78	0.43	1031.12	1031.46	
10-Jun-02	1.67	1.29	1030.23	1030.60	
23-Sep-02	1.39	1.00	1030.51	1030.89	
11-Jun-03	1.45	1.03	1030.45	1030.86	
10-Sep-03	2.35	1.90	1029.55	1029.99	
10-May-04	1.25	1.17	1031.52	1031.60	2004 survey info used from this point on
08-Jul-04	1.18	0.755	1031.59	1032.02	
19-Jul-04	1.42	0.99	1031.35	1031.78	
09-Sep-04	1.825	1.4	1030.95	1031.37	
26-May-05	0.53	0.6	1032.24	1032.17	bottom, no beep
14-Sep-05	2.69	3.215	1030.08	1029.56	
09-Mar-06	1.99	3.71	1030.78	1029.06	
27-Mar-06	1.99	3.42	1030.78	1029.35	bottom
14-Jun-06	1.985	2.595	1030.79	1030.18	bottom
02-Oct-06	2.85	3.4	1029.92	1029.37	
22-May-07	0.82	2.13	1031.95	1030.64	a-beep, b-frozen no beep
26-Sep-07	2.445	3	1030.33	1029.77	

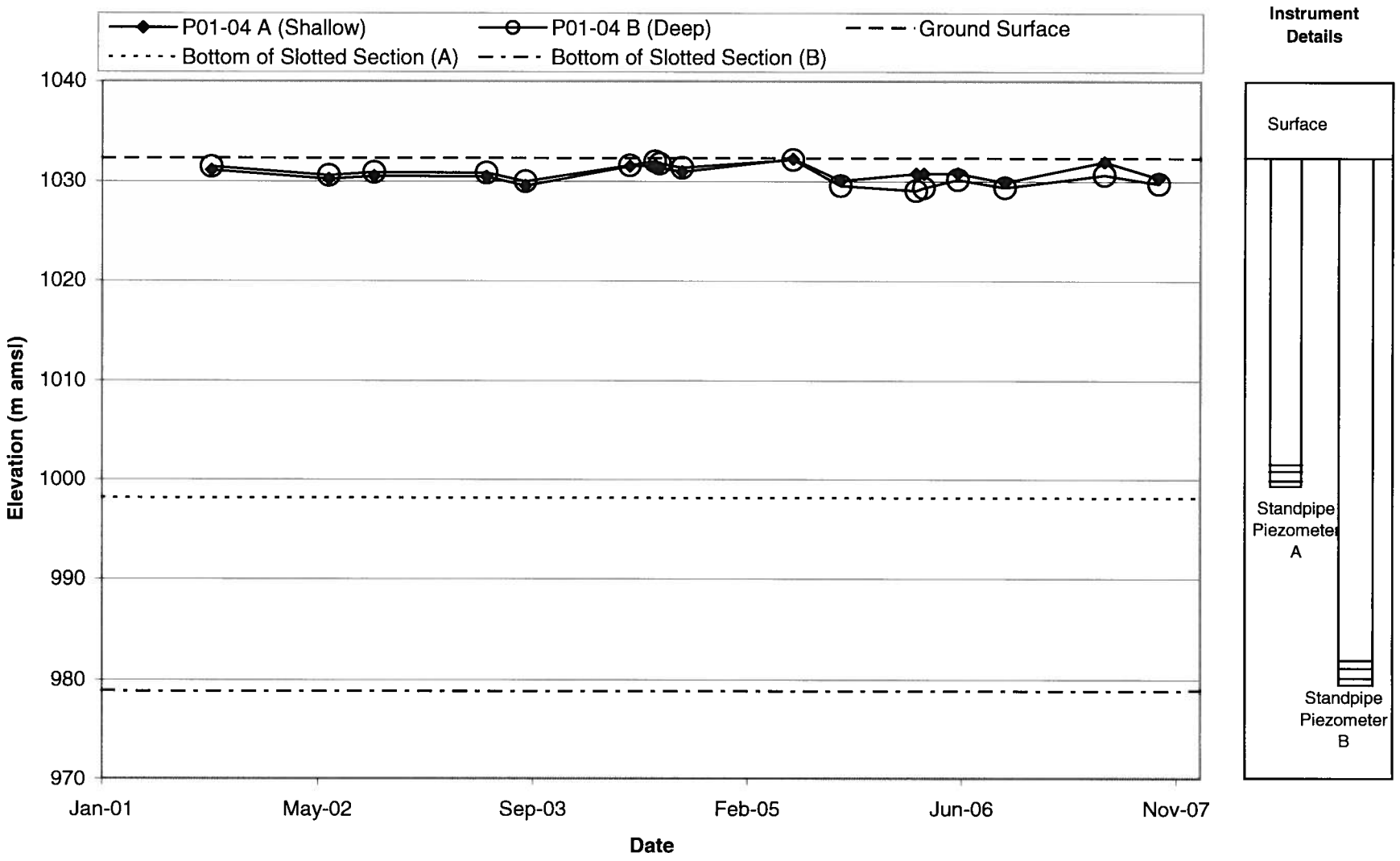
INTERMEDIATE DAM
Piezometric Monitoring
P01-04A (2001 - GLL Monitoring Well)



INTERMEDIATE DAM
Piezometric Monitoring
P01-04B (2001 - GLL Monitoring Well)



INTERMEDIATE DAM
Piezometric Monitoring
P01-04 (2001 - GLL Monitoring Well)

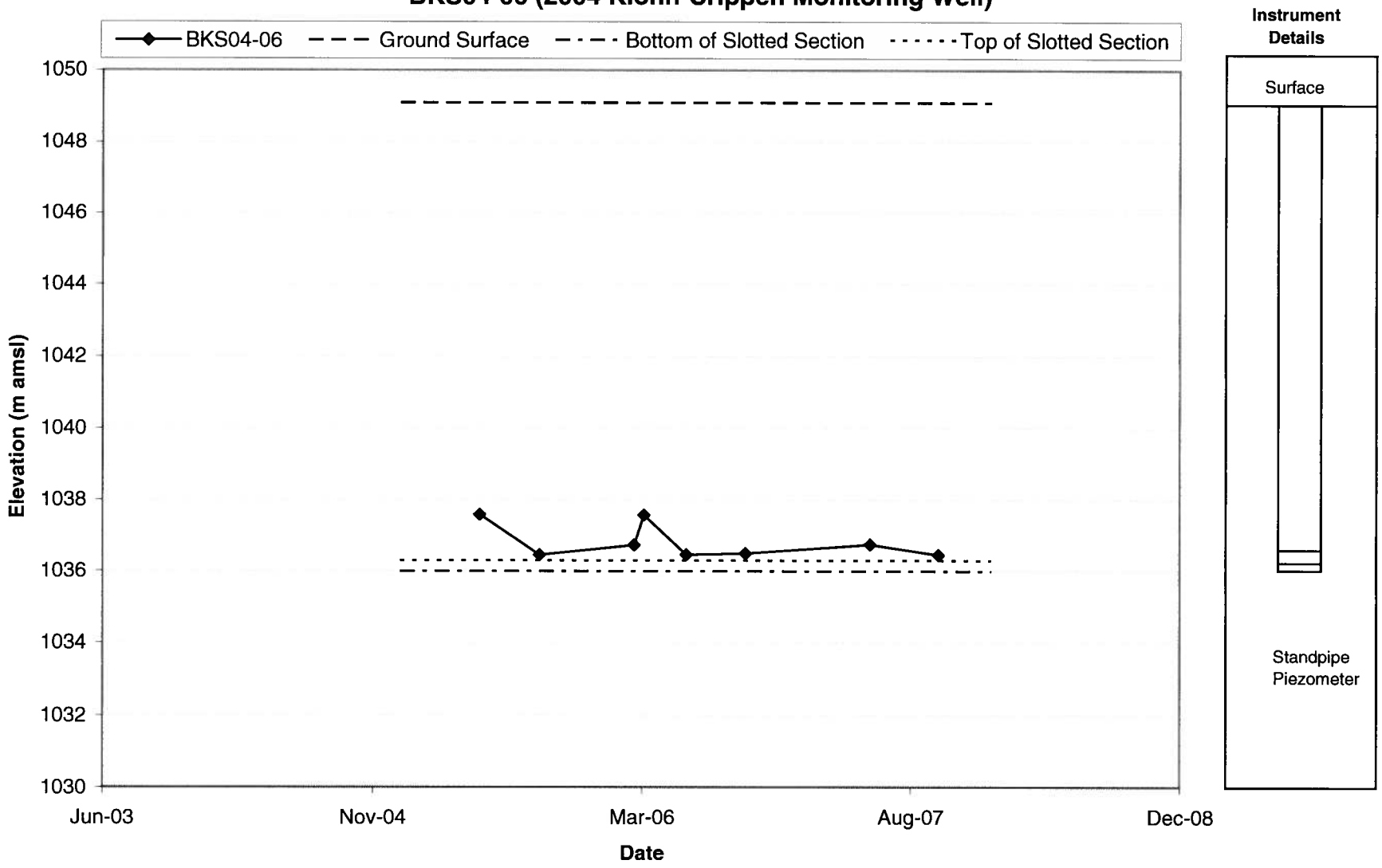


Faro Mine Instrumentation - Diversion Canal Dike

BKS04-06		Location:	Intermediate Dam South Abutment	2004 Stick-Up (m):	1.51
		Coordinates:	N 6913803 E 580454.9	Tip Elevation (m amsl):	1036.00
Surface Protector:	yes	Date Installed:	1996	2004 Surface Elevation (m amsl):	1049.1
				Screened Interval (m bgs):	12.8 - 13.1

Date	Water level from top of pipe (m)		Piezometric Elevation (m amsl)	Pond El. (m amsl)	Comments
26-May-05	13.01		1037.60		
14-Sep-05	14.15		1036.46		bottom - no beep
09-Mar-06	13.87		1036.74		
27-Mar-06	13.035		1037.57		no beep
14-Jun-06	14.14		1036.47		sticky at 11.0m
02-Oct-06	14.11		1036.50		
22-May-07	13.855		1036.75	1046.781	Bottom no beep
26-Sep-07	14.15		1036.46		no beep

INTERMEDIATE DAM
Piezometric Monitoring
BKS04-06 (2004 Klohn-Crippen Monitoring Well)

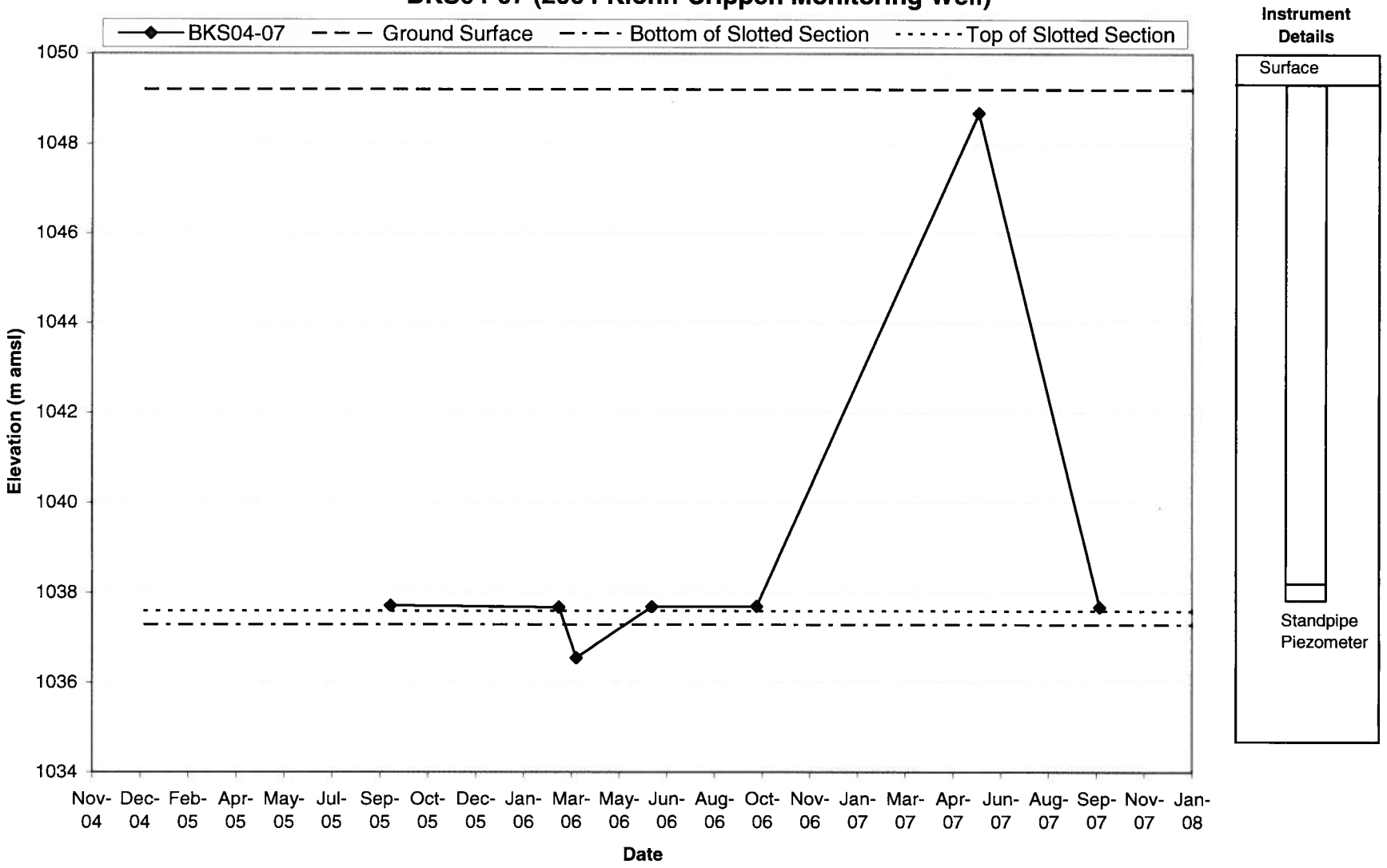


Faro Mine Instrumentation - Intermediate Dam

BKS04-07		Location:	Intermediate Dam South Abutment	2004 Stick-Up (m):	1.51
		Coordinates:	N 6913747 E 580407.6	Tip Elevation (m amsl):	1037.29
Surface Protector:	yes	Date Installed:	1996	2004 Surface Elevation (m amsl):	1049.2
				Screened Interval (m bgs):	11.5 - 11.81

Date		Water level from top of pipe (m)	Piezometric Elevation (m amsl)	Pond El. (m amsl)	Comments
26-May-05		14.155			Impossible reading
14-Sep-05		12.99	1037.72		
09-Mar-06		13.03	1037.68		
27-Mar-06		14.16	1036.55		no beep
14-Jun-06		13.02	1037.69		sticky at 12.7 m
02-Oct-06		13.01	1037.70		
22-May-07		2.03		1046.781	no beep, frozen
26-Sep-07		13.025	1037.69	1047.781	

INTERMEDIATE DAM
Piezometric Monitoring
BKS04-07 (2004 Klohn-Crippen Monitoring Well)



CROSS VALLEY DAM

PIEZOMETERS

Faro Mine Instrumentation - Cross Valley Dam

CVDC-4		Location:	Cross Valley Dam Crest Stn. 0+215	2004 Ground Elevation (m amsl):	1033.3		
		Coordinates:	8V580266 6914331	Shallow Tip Elevation (m amsl):	1007.9	2004 Shallow stick-up 2004 (m):	0.11
Surface Protector:	yes	Date Installed:	1981	Deep Tip Elevation (m amsl):	999.7	2004 Deep stick-up (m):	0.3

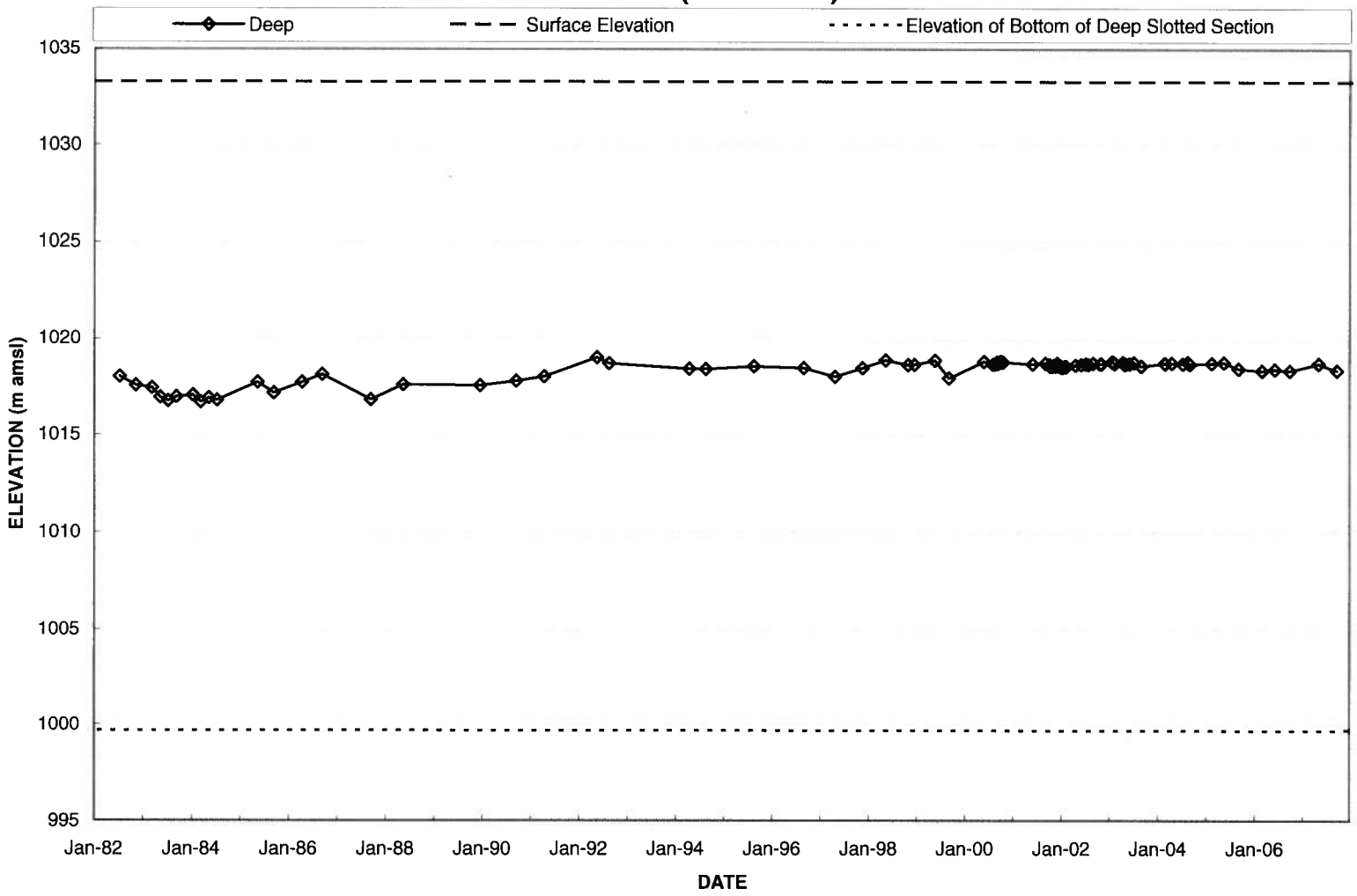
Date		Water Level from top of pipe (m)		Piezometric Elevation (m amsl)		Pond Elevation (m amsl)	Comments
		Shallow	Deep	Shallow	Deep		
Aug-82		15.10	15.26	1018.33	1018.04		
Dec-82		15.82	15.71	1017.61	1017.59		
Apr-83		15.71	15.84	1017.72	1017.46	1029.33	
Jun-83		16.54	16.33	1016.89	1016.97	1025.88	
Aug-83		16.57	16.52	1016.86	1016.78		
Oct-83		16.34	16.30	1017.09	1017.00		
Feb-84		16.21	16.22	1017.22	1017.08		
Mar-84						1030.60	
Apr-84		16.75	16.58	1016.68	1016.72		
Jun-84		16.40	16.37	1017.03	1016.93	1026.80	
Aug-84		16.50	16.48	1016.93	1016.82		
Jun-85		15.50	15.55	1017.93	1017.75	1031.20	
Oct-85		16.00	16.10	1017.43	1017.20		
May-86		15.58	15.54	1017.85	1017.76	1030.70	
Oct-86		14.99	15.14	1018.44	1018.16	1030.90	
Oct-87		15.42	16.45	1018.01	1016.85		
Jun-88			15.67		1017.63		
Jan-90			15.78		1017.59		
Oct-90			15.54		1017.83		
May-91			15.31		1018.06		
Jun-92			14.32		1019.05		
Sep-92			14.63		1018.74		
May-94			14.93		1018.47		
Sep-94			14.95		1018.45		
Sep-95			14.80		1018.60		
13-Sep-96			14.89		1018.51	1029.915	
7-May-97			15.34		1018.06		
2-Dec-97			14.89		1018.51		shallow standpipe - dry
26-May-98			14.66		1018.92	1031.2	
13-Nov-98			14.91		1018.67	1029.8	
29-Dec-98			14.89		1018.69	1029.8	
3-Jun-99			14.671		1018.91	1031.4	
18-Sep-99			15.60		1017.98	~1029.2	
8-Jun-00			14.73		1018.85	~1030.2	
14-Aug-00			14.88		1018.70		
31-Aug-00			14.86		1018.72		
7-Sep-00			14.83		1018.75		
14-Sep-00			14.76		1018.82		
21-Sep-00			14.84		1018.74		shallow standpipe - plugged
28-Sep-00			14.79		1018.79		shallow standpipe - plugged
6-Oct-00			14.75		1018.83		shallow standpipe - n.r.
12-Oct-00			14.76		1018.82		shallow standpipe - n.r.
20-Oct-00			14.74		1018.84		blocked @ 1.25m
27-Oct-00			14.76		1018.82		shallow standpipe - blocked @ 7.60m
10-Jun-01		7.67	14.87		1018.71		shallow standpipe - blocked @ 7.61m
14-Sep-01		7.61	14.82		1018.76		shallow standpipe - blocked @ 7.61m
16-Oct-01		7.61	14.90		1018.68		shallow standpipe - blocked @ 7.62m
18-Oct-01		7.61	14.93		1018.65		shallow standpipe - blocked @ 7.61m
19-Oct-01		7.61	14.95		1018.63		shallow standpipe - blocked @ 7.61m
20-Oct-01		7.61	14.96		1018.62		shallow standpipe - blocked @ 7.61m
21-Oct-01		7.61	14.97		1018.61		shallow standpipe - blocked @ 7.61m
22-Oct-01		7.61	14.98		1018.60		shallow standpipe - blocked @ 7.61m
25-Oct-01		7.61	14.98		1018.60		shallow standpipe - blocked @ 7.61m
29-Oct-01		7.61	14.98		1018.60		shallow standpipe - blocked @ 7.61m
1-Nov-01		7.61	14.975		1018.61		shallow standpipe - blocked @ 7.61m
5-Nov-01		7.61	14.97		1018.61		
6-Nov-01		7.61	14.97		1018.61		
8-Nov-01		7.61	14.965		1018.62		
12-Nov-01		7.61	14.96		1018.62		
15-Nov-01		7.61	14.95		1018.63		
19-Nov-01		7.61	14.95		1018.63		
21-Nov-01		7.61	14.95		1018.63		
23-Nov-01		7.61	14.94		1018.64		pond elev approx - 8 ft.
26-Nov-01		7.61	14.95		1018.63		daytime temp -34 C
28-Nov-01		7.61	14.94		1018.64		
30-Nov-01		7.61	14.94		1018.64		
3-Dec-01		7.61	14.96		1018.62		
5-Dec-01		7.61	14.97		1018.61		
12-Dec-01		7.61	14.94		1018.64		
14-Dec-01		7.61	14.82		1018.76		

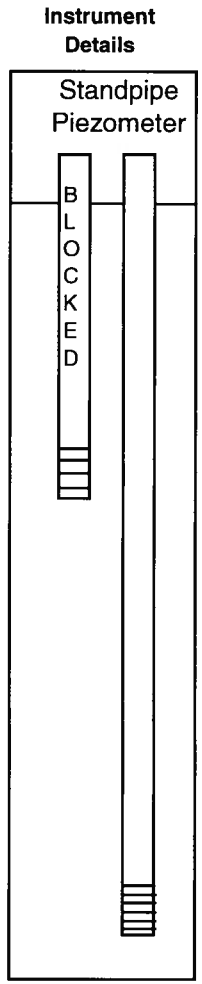
Faro Mine Instrumentation - Cross Valley Dam

CVDC-4		Location:	Cross Valley Dam Crest Stn. 0+215	2004 Ground Elevation (m amsl):	1033.3		
		Coordinates:	8V580266 6914331	Shallow Tip Elevation (m amsl):	1007.9	2004 Shallow stick-up 2004 (m):	0.11
Surface Protector:	yes	Date Installed:	1981	Deep Tip Elevation (m amsl):	999.7	2004 Deep stick-up (m):	0.3

Date		Water Level from top of pipe (m)		Piezometric Elevation (m amsl)		Pond Elevation (m amsl)	Comments
		Shallow	Deep	Shallow	Deep		
15-Dec-01		7.61	14.84		1018.74		
16-Dec-01		7.61	14.87		1018.71		
17-Dec-01		7.61	14.9		1018.68		
18-Dec-01		7.61	14.92		1018.66		
19-Dec-01		7.61	14.94		1018.64		
26-Dec-01		7.61	14.96		1018.62		
2-Jan-02		7.61	14.94		1018.64		
9-Jan-02		7.61	14.99		1018.59		
16-Jan-02		7.61	15.04		1018.54		
23-Jan-02		7.61	15.02		1018.56		
30-Jan-02		7.61	15.02		1018.56		
6-Feb-02		7.61	15.00		1018.58		
13-Feb-02		7.61	15		1018.58		
20-Feb-02		7.61	14.99		1018.59		
1-May-02		7.61	14.915		1018.67		
12-Jun-02		7.61	14.895		1018.69		
17-Jul-02		7.61	14.845		1018.74		
7-Aug-02		7.61	14.895		1018.69		
9-Sep-02		7.61	14.82		1018.76		
4-Nov-02		7.61	14.86		1018.72		
10-Nov-02		7.61	14.85		1018.73		
30-Jan-03		7.61	14.75		1018.83		
9-Feb-03		7.61	14.755		1018.83		start siphon
11-Feb-03		7.61	14.765		1018.82		
13-Feb-03		7.61	14.78		1018.80		
18-Feb-03		7.61	14.8		1018.78		
21-Feb-03		7.61	14.83		1018.75	1026.18	
23-Apr-03		7.61	14.78		1018.80		
7-May-03		7.61	14.875		1018.71		
16-May-03		7.61	14.87		1018.71		
11-Jun-03		7.61	14.85		1018.73		
15-Jul-03		7.61	14.78		1018.80		
10-Sep-03		7.61	14.965		1018.62		
4-Mar-04		7.61	14.84		1018.76		2004 Survey data used from here on
8-Mar-04		7.61	14.86		1018.74		
26-Apr-04		7.61	14.83		1018.77		
19-Jul-04		7.61	14.875		1018.725		
26-Aug-04		7.61	14.775		1018.825		
9-Sep-04		7.61	14.89		1018.71		
22-Feb-05		7.61	14.84		1018.76		
23-Feb-05		7.61	14.84		1018.76		
24-Feb-05		7.61	14.845		1018.76		
26-May-05		7.61	14.79		1018.81		
14-Sep-05		7.61	15.12		1018.48		
9-Mar-06		7.61	15.225		1018.38		
14-Jun-06		7.61	15.14		1018.46		
4-Oct-06		7.61	15.225		1018.38	1027.468	
9-May-07		7.61	14.855		1018.75	1029.295	
24-Sep-07		7.61	15.21		1018.39	1030.295	

CROSS VALLEY DAM
Pieometric Monitoring
CVDC-4 Deep Standpipe
(Dam Crest)





Faro Mine Instrumentation - Cross Valley Dam

CVDC-7		Location:	Cross Valley Dam Crest St.0+450	2004 Ground Elevation (m amsl):	1033.24		
		Coordinates:	8V580158 6914127	2004 Shallow Tip Elevation (m amsl):	1007.80	2004 Shallow stick-up (m):	0.31
Surface Protector:	yes	Date Installed:	1981	Deep Tip Elevation (m amsl):	1002.90	2004 Deep stick-up (m):	0.23

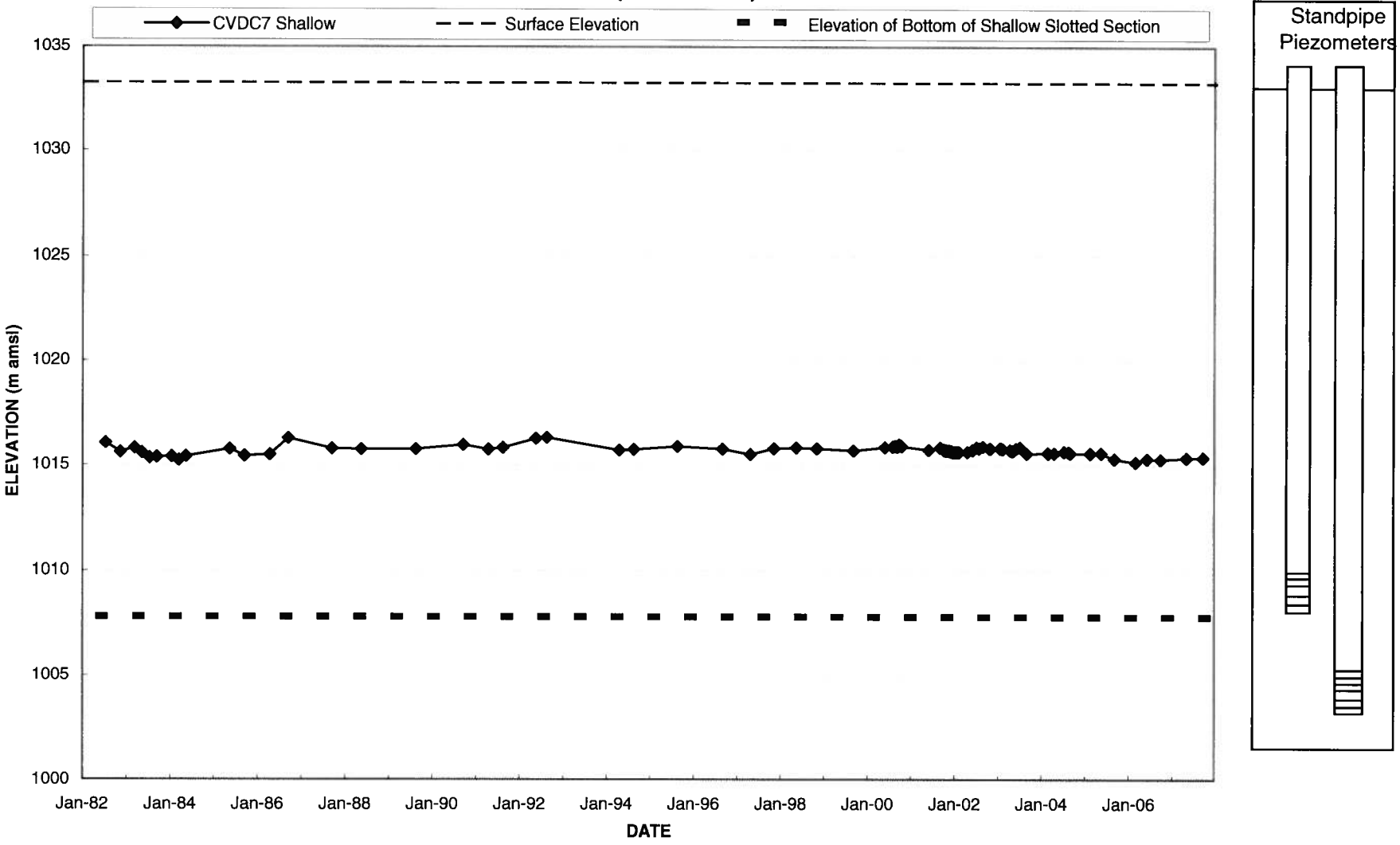
Date		Water Level from top of pipe (m)		Piezometric Elevation (m amsl)		Pond Elevation (m amsl)	Comments
		Shallow	Deep	Shallow	Deep		
Aug-82		17.58	14.44	1016.04	1019.09		
Dec-82		18.02	15.10	1015.60	1018.43		
Apr-83		17.83	15.24	1015.79	1018.29	1029.33	
Jun-83		18.06	14.88	1015.56	1018.65	1025.88	
Aug-83		18.30	16.24	1015.32	1017.29		
Oct-83		18.26	16.01	1015.36	1017.52		
Feb-84		18.24	15.92	1015.38	1017.61		
Mar-84						1030.60	
Apr-84		18.41	16.36	1015.21	1017.17		
Jun-84		18.22	16.06	1015.40	1017.47	1026.80	
Jun-85		17.87	16.06	1015.75	1017.47	1031.20	
Oct-85		18.20	15.55	1015.42	1017.98		
May-86		18.14	15.14	1015.48	1018.39	1030.70	
Oct-86		17.35	14.40	1016.27	1019.13	1030.90	
Oct-87		17.85	14.85	1015.77	1018.68		
Jun-88		17.90	15.10	1015.73	1018.59		
Sep-89		17.88	15.03	1015.75	1018.66		
Oct-90		17.68	15.03	1015.95	1018.66		
May-91		17.89	15.36	1015.74	1018.33		
Sep-91		17.81		1015.82			
Jun-92		17.37	14.48	1016.26	1019.21		
Sep-92		17.33	14.66	1016.30	1019.03		
May-94		17.99	15.50	1015.70	1018.16		
Sep-94		17.95	15.47	1015.74	1018.19		
Sep-95		17.81	15.08	1015.88	1018.58		
13-Sep-96		17.93	15.34	1015.76	1018.32	1029.915	
7-May-97		18.19	16.07	1015.50	1017.59		
20-Nov-97		17.91	15.29	1015.78	1018.37		
26-May-98		17.87	15.12	1015.82	1018.54	1031.2	
15-Nov-98		17.91	15.38	1015.78	1018.28	1029.8	
3-Jun-99		n.r.	15.10		1018.56	1031.4	
18-Sep-99		18.00	15.59	1015.69	1018.07	~1029.2	
8-Jun-00		17.85	15.08	1015.84	1018.58	~1030.2	
14-Aug-00		17.82	15.10	1015.87	1018.56		
31-Aug-00		17.80	15.16	1015.89	1018.50		
7-Sep-00		17.78	15.09	1015.91	1018.57		
14-Sep-00		17.78	15.80	1015.91	1017.86		
19-Sep-00		17.82	15.19	1015.87	1018.47		
21-Sep-00		17.82	15.16	1015.87	1018.50		
28-Sep-00		17.77	15.60	1015.92	1018.06		
6-Oct-00		17.71	14.96	1015.98	1018.70		
12-Oct-00		17.75	15.03	1015.94	1018.63		
20-Oct-00		17.76	15.00	1015.93	1018.66		
27-Oct-00		17.80	15.08	1015.89	1018.58		
10-Jun-01		17.97	15.39	1015.72	1018.27		
14-Sep-01		17.86	15.16	1015.83	1018.50		
16-Oct-01		17.95	15.43	1015.74	1018.23		
18-Oct-01		17.97	15.48	1015.72	1018.18		
19-Oct-01		17.98	15.49	1015.71	1018.17		
20-Oct-01		17.98	15.49	1015.71	1018.17		
21-Oct-01		17.98	15.49	1015.71	1018.17		
22-Oct-01		17.98	15.5	1015.71	1018.16		
25-Oct-01		17.99	15.51	1015.70	1018.15		
29-Oct-01		17.99	15.51	1015.70	1018.15		
1-Nov-01		17.985	15.495	1015.71	1018.17		
5-Nov-01		17.99	15.505	1015.70	1018.16		
6-Nov-01		17.99	15.505	1015.70	1018.16		
8-Nov-01		17.99	15.51	1015.70	1018.15		
12-Nov-01		18	15.51	1015.69	1018.15		
15-Nov-01		18	15.51	1015.69	1018.15		
19-Nov-01		18	15.51	1015.69	1018.15		
21-Nov-01		17.99	15.495	1015.70	1018.17		
23-Nov-01		17.99	15.495	1015.70	1018.17		pond elev approx - 8 ft.
26-Nov-01		18	15.495	1015.69	1018.17		daytime temp -34 C
28-Nov-01		18	15.5	1015.69	1018.16		
30-Nov-01		18.01	15.5	1015.68	1018.16		
3-Dec-01		18.01	15.51	1015.68	1018.15		
5-Dec-01		18.01	15.52	1015.68	1018.14		

Faro Mine Instrumentation - Cross Valley Dam

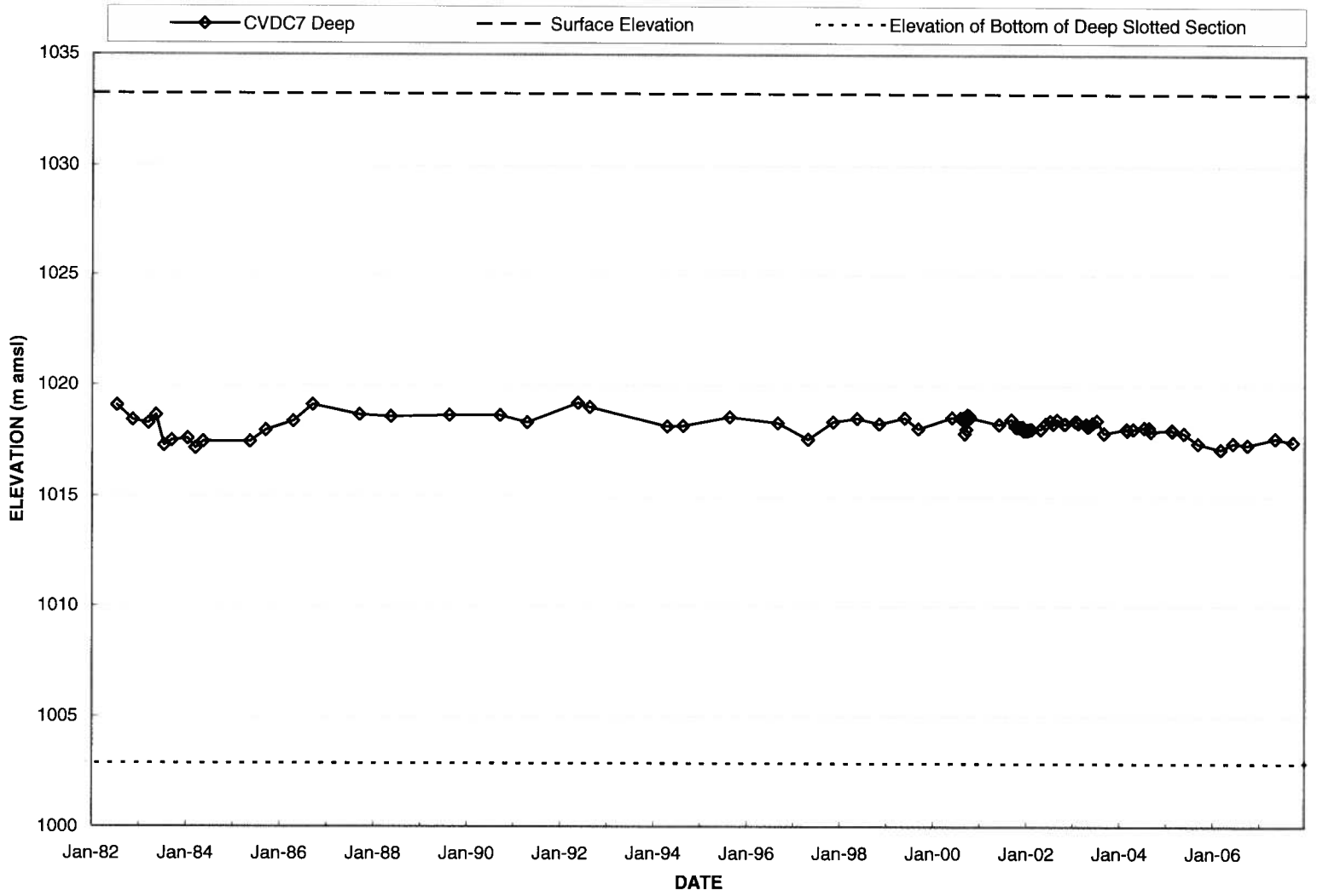
CVDC-7		Location:	Cross Valley Dam Crest St.0+450	2004 Ground Elevation (m amsl):	1033.24		
		Coordinates:	8V580158 6914127	2004 Shallow Tip Elevation (m amsl):	1007.80	2004 Shallow stick-up (m):	0.31
Surface Protector:	yes	Date Installed:	1981	Deep Tip Elevation (m amsl):	1002.90	2004 Deep stick-up (m):	0.23

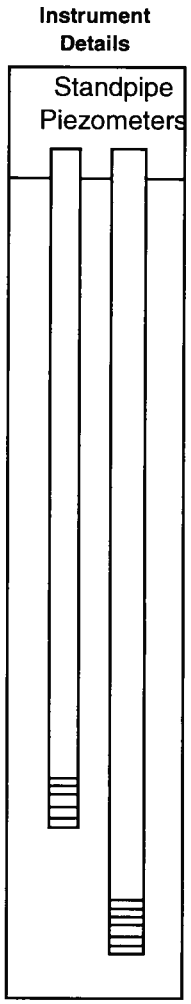
Date		Water Level from top of pipe (m)		Piezometric Elevation (m amsl)		Pond Elevation (m amsl)	Comments
		Shallow	Deep	Shallow	Deep		
12-Dec-01		18.01	15.52	1015.68	1018.14		
14-Dec-01		18.01	15.5	1015.68	1018.16		
15-Dec-01		18.02	15.54	1015.67	1018.12		
16-Dec-01		18.03	15.58	1015.66	1018.08		
17-Dec-01		18.04	15.61	1015.65	1018.05		
18-Dec-01		18.05	15.63	1015.64	1018.03		
19-Dec-01		18.06	15.65	1015.63	1018.01		
26-Dec-01		18.07	15.66	1015.62	1018.00		
2-Jan-02		18.07	15.65	1015.62	1018.01		
9-Jan-02		18.08	15.66	1015.61	1018.00		
16-Jan-02		18.08	15.65	1015.61	1018.01		
23-Jan-02		18.07	15.63	1015.62	1018.03		
30-Jan-02		18.08	15.63	1015.61	1018.03		
6-Feb-02		18.075	15.62	1015.62	1018.04		
13-Feb-02		18.07	15.6	1015.62	1018.06		
20-Feb-02		18.075	15.6	1015.62	1018.06		
1-May-02		18.07	15.6	1015.62	1018.06		Water being discharged from the polishing pond
12-Jun-02		17.975	15.35	1015.72	1018.31		
17-Jul-02		17.85	15.225	1015.84	1018.44		
7-Aug-02		17.9	15.35	1015.79	1018.31		
9-Sep-02		17.815	15.17	1015.88	1018.49		
4-Nov-02		17.91	15.36	1015.78	1018.30		
10-Nov-02		17.91	15.355	1015.78	1018.31		
30-Jan-03		17.895	15.235	1015.80	1018.43		
9-Feb-03		17.9	15.245	1015.79	1018.42		start siphon
11-Feb-03		17.905	15.256	1015.79	1018.40		
13-Feb-03		17.91	15.28	1015.78	1018.38		
18-Feb-03		17.925	15.31	1015.77	1018.35		
21-Feb-03		17.93	15.32	1015.76	1018.34	1026.18	
23-Apr-03		17.98	15.37	1015.71	1018.29		
7-May-03		18.01	15.47	1015.68	1018.19		
16-May-03		18.01	15.455	1015.68	1018.21		
11-Jun-03		17.91	15.33	1015.78	1018.33		
15-Jul-03		17.84	15.205	1015.85	1018.46		
10-Sep-03		18	15.585	1015.55	1017.88		
4-Mar-04		17.97	15.39	1015.58	1018.08		2004 Survey data used from here on
8-Mar-04		18	15.46	1015.55	1018.01		
26-Apr-04		17.98	15.4	1015.57	1018.07		
19-Jul-04		17.91	15.33	1015.64	1018.14		
26-Aug-04		17.93	15.34	1015.619	1018.129		
9-Sep-04		17.985	15.5	1015.564	1017.97		
22-Feb-05		17.995	15.43	1015.554	1018.039		
23-Feb-05		18	15.45	1015.549	1018.019		smells like old oil
24-Feb-05		18	15.48	1015.549	1017.989		
26-May-05		17.99	15.575	1015.559	1017.894		milky on probe
14-Sep-05		18.25	16.04	1015.299	1017.429		
9-Mar-06		18.41	16.3	1015.14	1017.17		
14-Jun-06		18.255	16.03	1015.29	1017.44		
4-Oct-06		18.27	16.095	1015.28	1017.37	1027.47	
9-May-07		18.2	15.8	1015.35	1017.67	1029.295	
24-Sep-07		18.185	15.965	1015.36	1017.50	1030.295	

CROSS VALLEY DAM
Piezometric Monitoring
CVDC-7 Shallow Standpipe Piezometer
(Dam Crest)

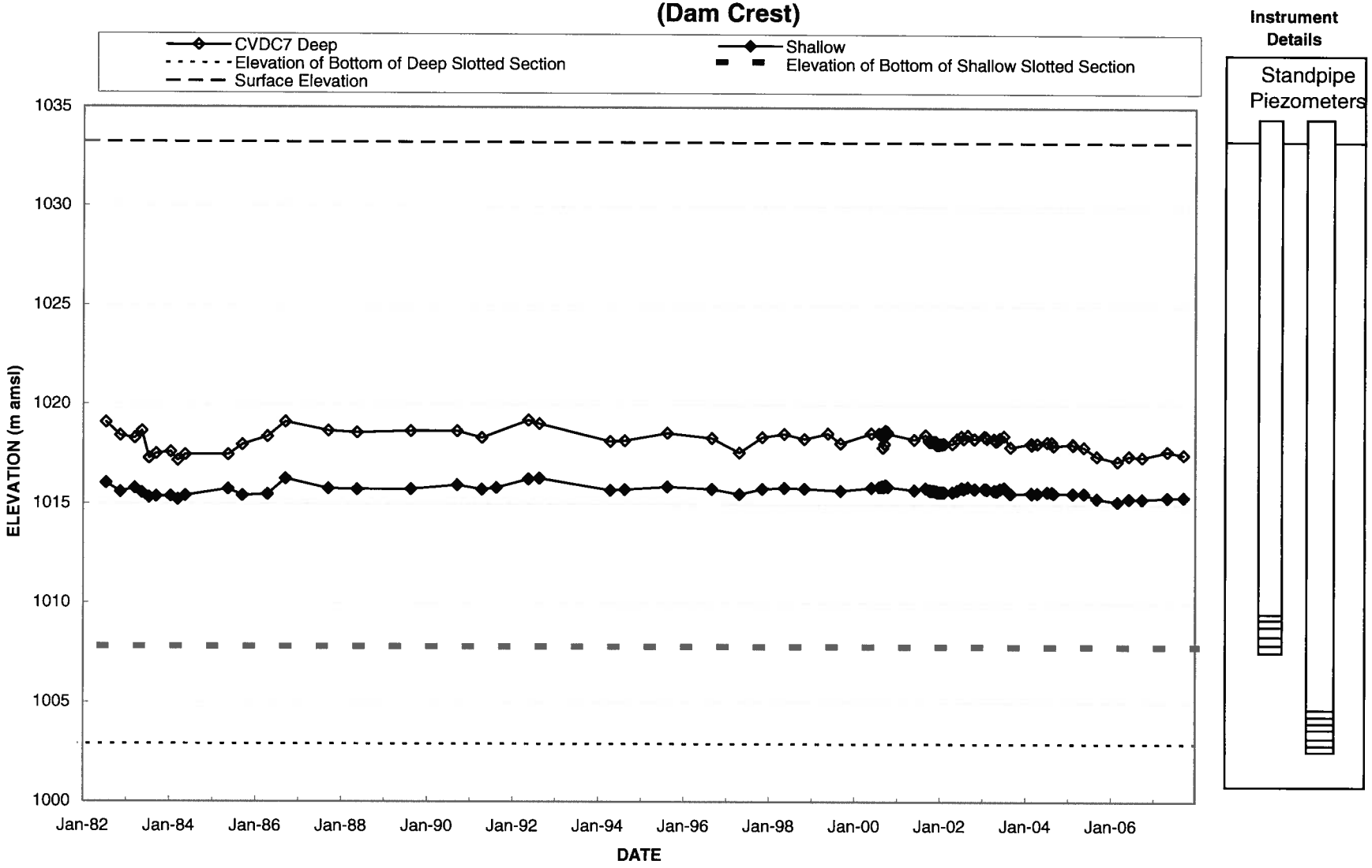


CROSS VALLEY DAM
Piezometric Monitoring
CVDC-7 Deep Standpipe Piezometer
(Dam Crest)





CROSS VALLEY DAM
Piezometric Monitoring
CVDC-7 Standpipe Piezometers
(Dam Crest)



Faro Mine Instrumentation - Cross Valley Dam

CVDC-9		Location:	Cross Valley Dam Crest St.0+565	2004 Ground Elevation (m amsl):	1033.28		
		Coordinates:	8V580096 6913998	2004 Shallow Tip Elevation (m amsl)	1007.70	2004 Shallow stick-up (m):	0.27
Surface Protector:	yes	Date Installed:	1981	2004 Deep Tip Elevation (m amsl):	1000.70	2004 Deep stick-up (m):	0.19

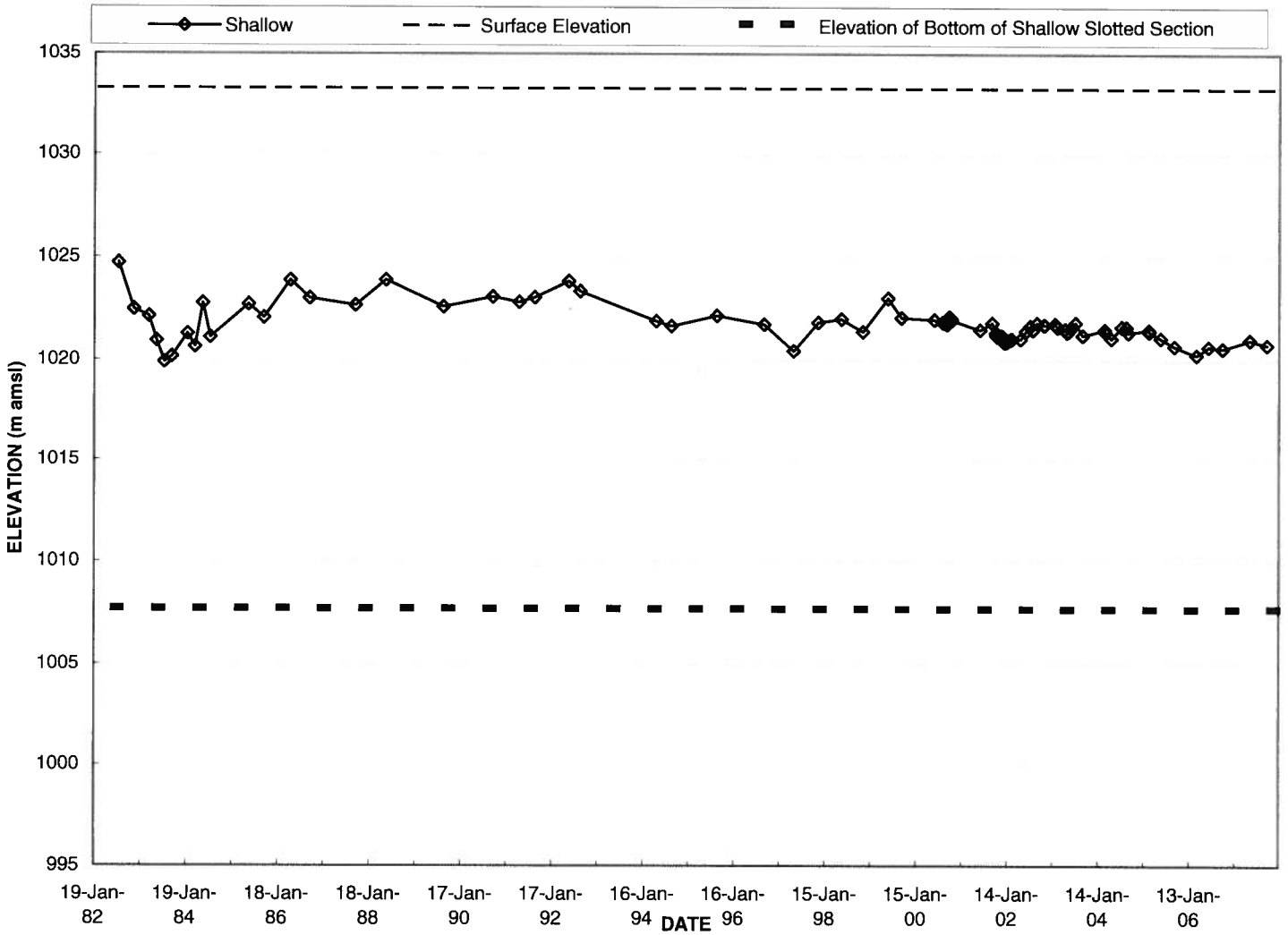
Date		Water Level below top of pipe (m)	Water Level below top of pipe (m)	Piezometric Elevation (m amsl)		Pond Elevation (m amsl)	Comments
		Shallow	Deep	Shallow	Deep		
1-Aug-82		8.80	8.85	1024.74	1024.61		
1-Dec-82		11.04	9.00	1022.50	1024.46		
1-Apr-83		11.38	9.81	1022.16	1023.65	1029.33	
1-Jun-83		12.58	10.74	1020.96	1022.72	1025.88	
1-Aug-83		13.63	11.90	1019.91	1021.56		
1-Oct-83		13.36	11.13	1020.18	1022.33		
1-Feb-84		12.24	10.67	1021.30	1022.79		
1-Mar-84						1030.60	
1-Apr-84		12.87	11.65	1020.67	1021.81		
1-Jun-84		10.75	12.28	1022.79	1021.18	1026.80	
1-Aug-84		12.41	11.05	1021.13	1022.41		
1-Jun-85		10.80	8.98	1022.74	1024.48	1031.20	
1-Oct-85		11.45	8.25	1022.09	1025.21		
1-May-86		9.65	11.18	1023.89	1022.28	1030.70	
1-Oct-86		10.51	8.79	1023.03	1024.67	1030.90	
1-Oct-87		10.85	9.10	1022.69	1024.36		
1-Jun-88		9.74	9.42	1023.90	1024.11		
1-Sep-89		11.01	9.07	1022.63	1024.46		
1-Oct-90		10.54	8.83	1023.10	1024.70		
1-May-91		10.79	9.14	1022.85	1024.39		
1-Sep-91		10.56		1023.08			
1-Jun-92		9.79	7.92	1023.85	1025.61		
1-Sep-92		10.27	8.29	1023.37	1025.24		
1-May-94		11.68	9.49	1021.94	1024.06		
1-Sep-94		11.93	9.82	1021.69	1023.73		
1-Sep-95		11.42	8.86	1022.20	1024.69		
13-Sep-96		11.84	9.52	1021.78	1024.03	1029.915	
7-May-97		13.15	11.57	1020.48	1021.99		
20-Nov-97		11.74	9.58	1021.88	1023.97		
26-May-98		11.57	9.11	1022.05	1024.44	1031.2	
13-Nov-98		12.19	9.90	1021.43	1023.65	1029.8	
3-Jun-99		10.560	8.868	1023.06	1024.68	1031.4	
18-Sep-99		11.50	10.25	1022.12	1023.30	~1029.2	
8-Jun-00		11.60	8.90	1022.02	1024.65	~1030.2	
14-Aug-00		11.73	9.19	1021.89	1024.36		
31-Aug-00		11.77	9.30	1021.85	1024.25		
7-Sep-00		11.66	9.12	1021.96	1024.43		
14-Sep-00		11.65	9.30	1021.97	1024.25		
19-Sep-00		11.83	9.34	1021.79	1024.21		
21-Sep-00		11.78	9.28	1021.84	1024.27		
28-Sep-00		11.61	9.40	1022.01	1024.15		
6-Oct-00		11.46	8.89	1022.16	1024.66		
12-Oct-00		11.57	9.00	1022.05	1024.55		
20-Oct-00		11.53	8.91	1022.09	1024.64		
27-Oct-00		11.62	9.03	1022.00	1024.52		
10-Jun-01		12.09	9.63	1021.53	1023.92		
14-Sep-01		11.75	9.67	1021.87	1023.88		
16-Oct-01		12.24	10.2	1021.38	1023.35		
18-Oct-01		12.35	10.33	1021.27	1023.22		
19-Oct-01		12.37	10.36	1021.25	1023.19		
20-Oct-01		12.38	10.37	1021.24	1023.18		
21-Oct-01		12.39	10.38	1021.23	1023.17		
22-Oct-01		12.40	10.39	1021.22	1023.16		
25-Oct-01		12.42	10.39	1021.20	1023.16		
29-Oct-01		12.405	10.34	1021.22	1023.21		
1-Nov-01		12.395	10.315	1021.23	1023.24		
5-Nov-01		12.41	10.31	1021.21	1023.24		
6-Nov-01		12.41	10.31	1021.21	1023.24		
8-Nov-01		12.41	10.3	1021.21	1023.25		
12-Nov-01		12.42	10.295	1021.20	1023.26		
15-Nov-01		12.42	10.285	1021.20	1023.27		
19-Nov-01		12.39	10.22	1021.23	1023.33		
21-Nov-01		12.37	10.19	1021.25	1023.36		
23-Nov-01		12.37	10.17	1021.25	1023.38		pond elev approx - 8 ft.
26-Nov-01		12.37	10.17	1021.25	1023.38		daytime temp -34 C
28-Nov-01		12.38	10.16	1021.24	1023.39		
30-Nov-01		12.385	10.17	1021.24	1023.38		
3-Dec-01		12.4	10.19	1021.22	1023.36		
5-Dec-01		12.42	10.2	1021.20	1023.35		
12-Dec-01		12.435	10.2	1021.19	1023.35		

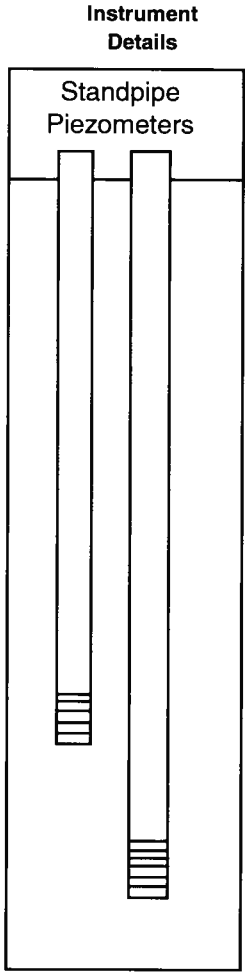
Faro Mine Instrumentation - Cross Valley Dam

CVDC-9		Location:	Cross Valley Dam Crest St.0+565	2004 Ground Elevation (m amsl):	1033.28		
		Coordinates:	8V580096 6913998	2004 Shallow Tip Elevation (m amsl)	1007.70	2004 Shallow stick-up (m):	0.27
Surface Protector:	yes	Date Installed:	1981	2004 Deep Tip Elevation (m amsl):	1000.70	2004 Deep stick-up (m):	0.19

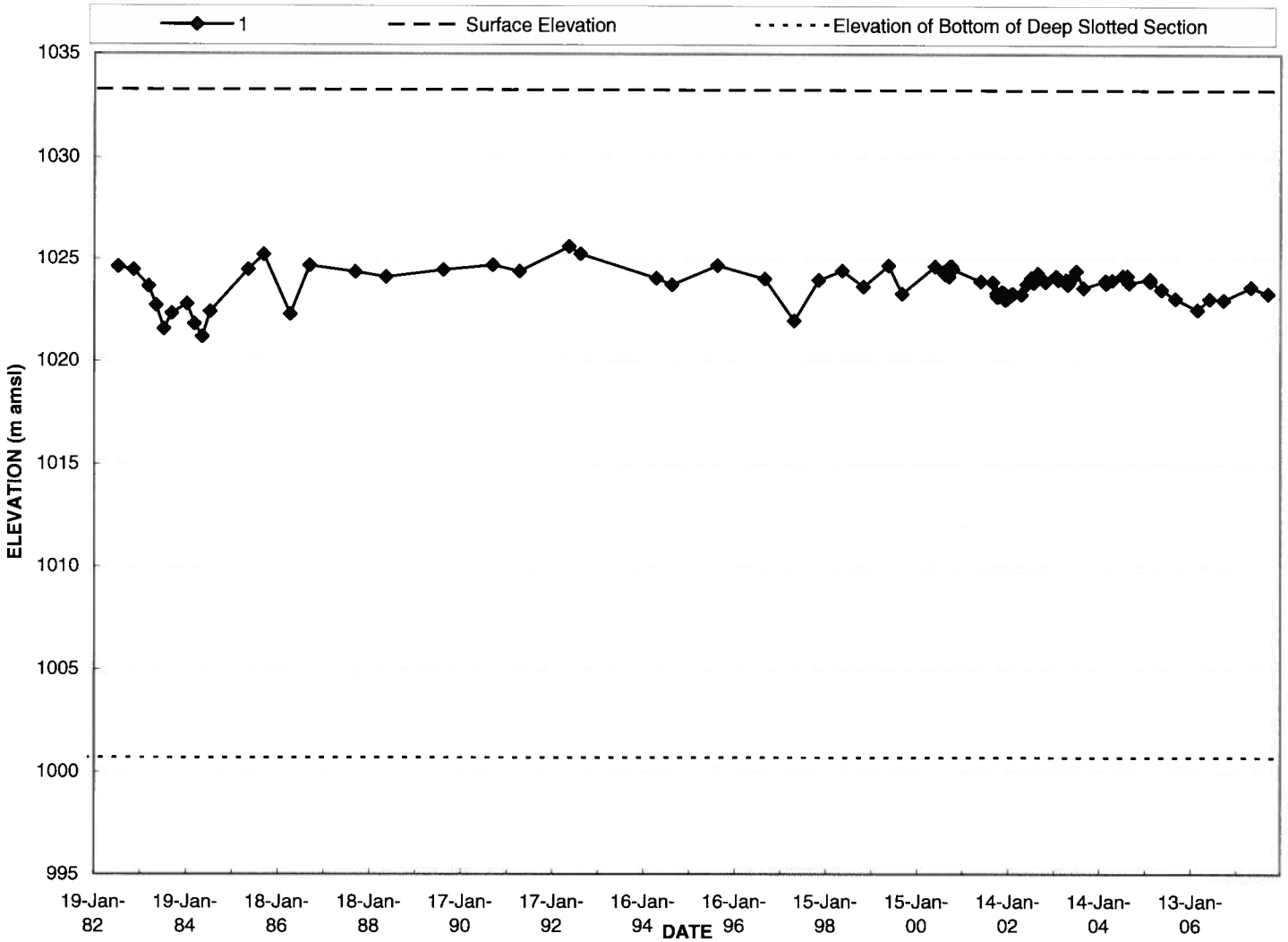
Date		Water Level below top of pipe (m)	Water Level below top of pipe (m)	Piezometric Elevation (m amsl)		Pond Elevation (m amsl)	Comments
		Shallow	Deep	Shallow	Deep		
14-Dec-01		12.47	10.25	1021.15	1023.30		
15-Dec-01		12.52	10.31	1021.10	1023.24		
16-Dec-01		12.57	10.38	1021.05	1023.17		
17-Dec-01		12.62	10.43	1021.00	1023.12		
18-Dec-01		12.66	10.48	1020.96	1023.07		
19-Dec-01		12.68	10.51	1020.94	1023.04		
26-Dec-01		12.72	10.53	1020.90	1023.02		
2-Jan-02		12.7	10.49	1020.92	1023.06		
9-Jan-02		12.68	10.45	1020.94	1023.10		
16-Jan-02		12.65	10.41	1020.97	1023.14		
23-Jan-02		12.62	10.36	1021.00	1023.19		
30-Jan-02		12.6	10.33	1021.02	1023.22		
6-Feb-02		12.585	10.31	1021.04	1023.24		
13-Feb-02		12.55	10.26	1021.07	1023.29		
20-Feb-02		12.55	10.25	1021.07	1023.30		
1-May-02		12.55	10.27	1021.07	1023.28		
12-Jun-02		12.155	9.77	1021.47	1023.78		
17-Jul-02		11.91	9.465	1021.71	1024.09		
7-Aug-02		12.1	9.705	1021.52	1023.85		
9-Sep-02		11.75	9.24	1021.87	1024.31		
4-Nov-02		11.85	9.64	1021.77	1023.91		
10-Nov-02		11.86	9.665	1021.76	1023.89		
30-Jan-03		11.805	9.395	1021.82	1024.16		
9-Feb-03		11.84	9.42	1021.78	1024.13		start siphon
11-Feb-03		11.87	9.455	1021.75	1024.10		
13-Feb-03		11.91	9.5	1021.71	1024.05		
18-Feb-03		11.96	9.55	1021.66	1024.00		
21-Feb-03		11.97	9.56	1021.65	1023.99	1026.18	
23-Apr-03		12.055	9.565	1021.57	1023.99		
7-May-03		12.21	9.78	1021.41	1023.77		
16-May-03		12.175	9.7	1021.45	1023.85		
11-Jun-03		11.99	9.46	1021.63	1024.09		
15-Jul-03		11.74	9.13	1021.88	1024.42		
10-Sep-03		12.355	9.95	1021.27	1023.60		
4-Mar-04		12.01	9.52	1021.54	1023.95		2004 Survey data used from here on
8-Mar-04		12.11	9.65	1021.44	1023.82		
26-Apr-04		12.45	9.5	1021.10	1023.97		
19-Jul-04		11.87	9.28	1021.68	1024.19		
26-Aug-04		11.88	9.28	1021.67	1024.19		
9-Sep-04		12.15	9.64	1021.40	1023.83		
22-Feb-05		12.02	9.44	1021.53	1024.03		
23-Feb-05		12.06	9.485	1021.49	1023.985		
24-Feb-05		12.11	9.555	1021.44	1023.915		
26-May-05		12.43	9.95	1021.12	1023.52		
14-Sep-05		12.83	10.385	1020.72	1023.085		
9-Mar-06		13.27	10.93	1020.28	1022.54		
14-Jun-06		12.86	10.4	1020.69	1023.07		
4-Oct-06		12.935	10.455	1020.62	1023.015	1027.468	
9-May-07		12.52	9.83	1021.03	1023.64	1029.295	
24-Sep-07		12.76	10.15	1020.79	1023.32	1030.295	

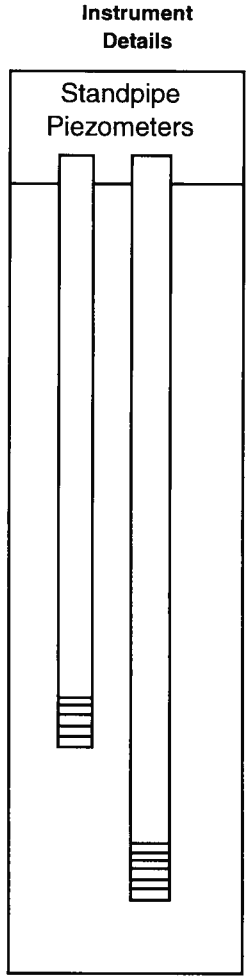
CROSS VALLEY DAM
Piezometric Monitoring
CVDC-9 Shallow Standpipe Piezometer
(Dam Crest)



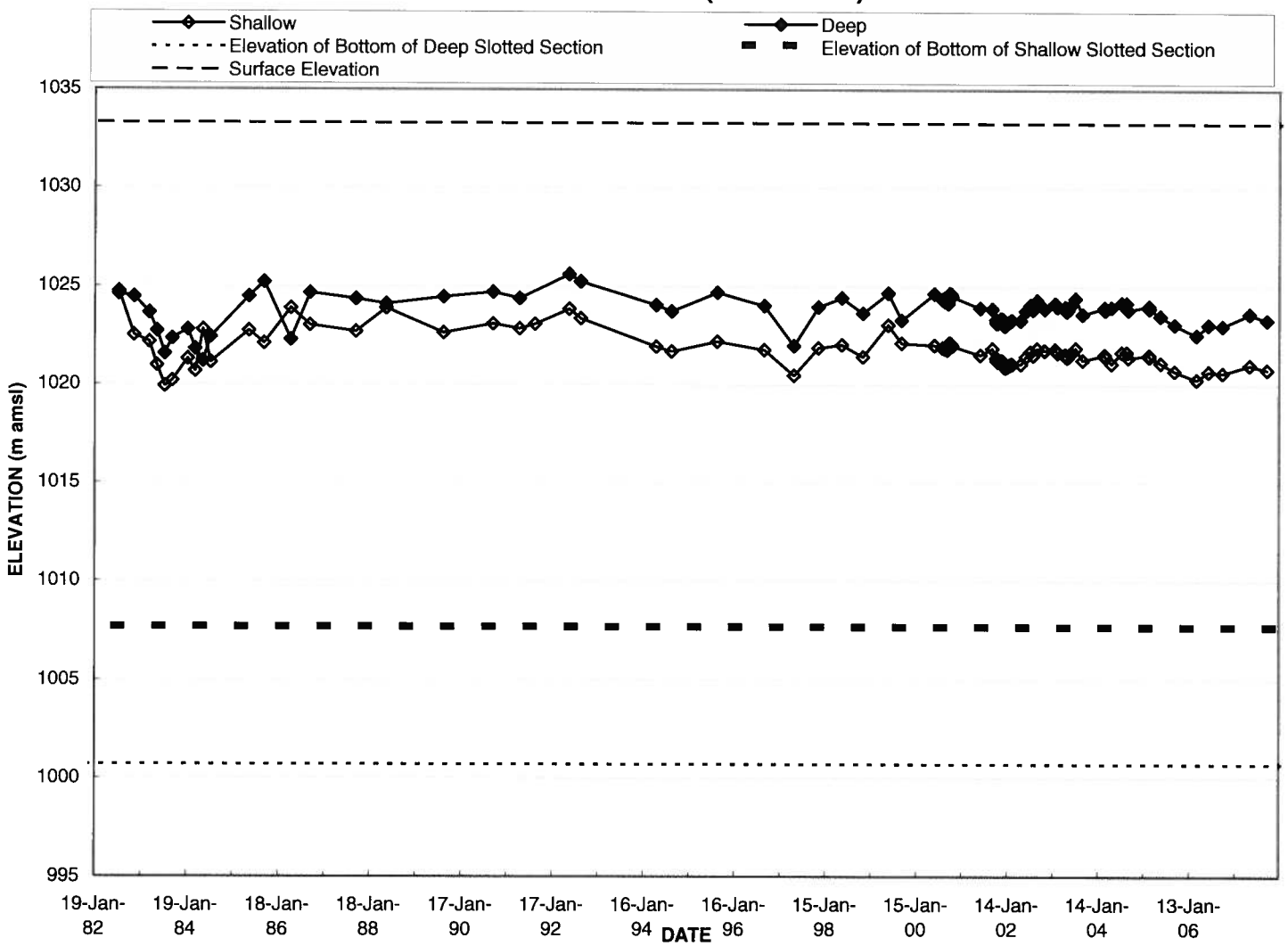


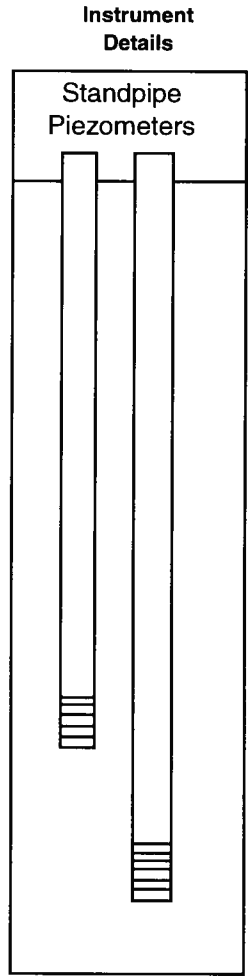
CROSS VALLEY DAM
Piezometric Monitoring
CVDC-9 Deep Standpipe Piezometer
(Dam Crest)





CROSS VALLEY DAM
Piezometric Monitoring
CVDC-9 Standpipe Piezometers
(Dam Crest)



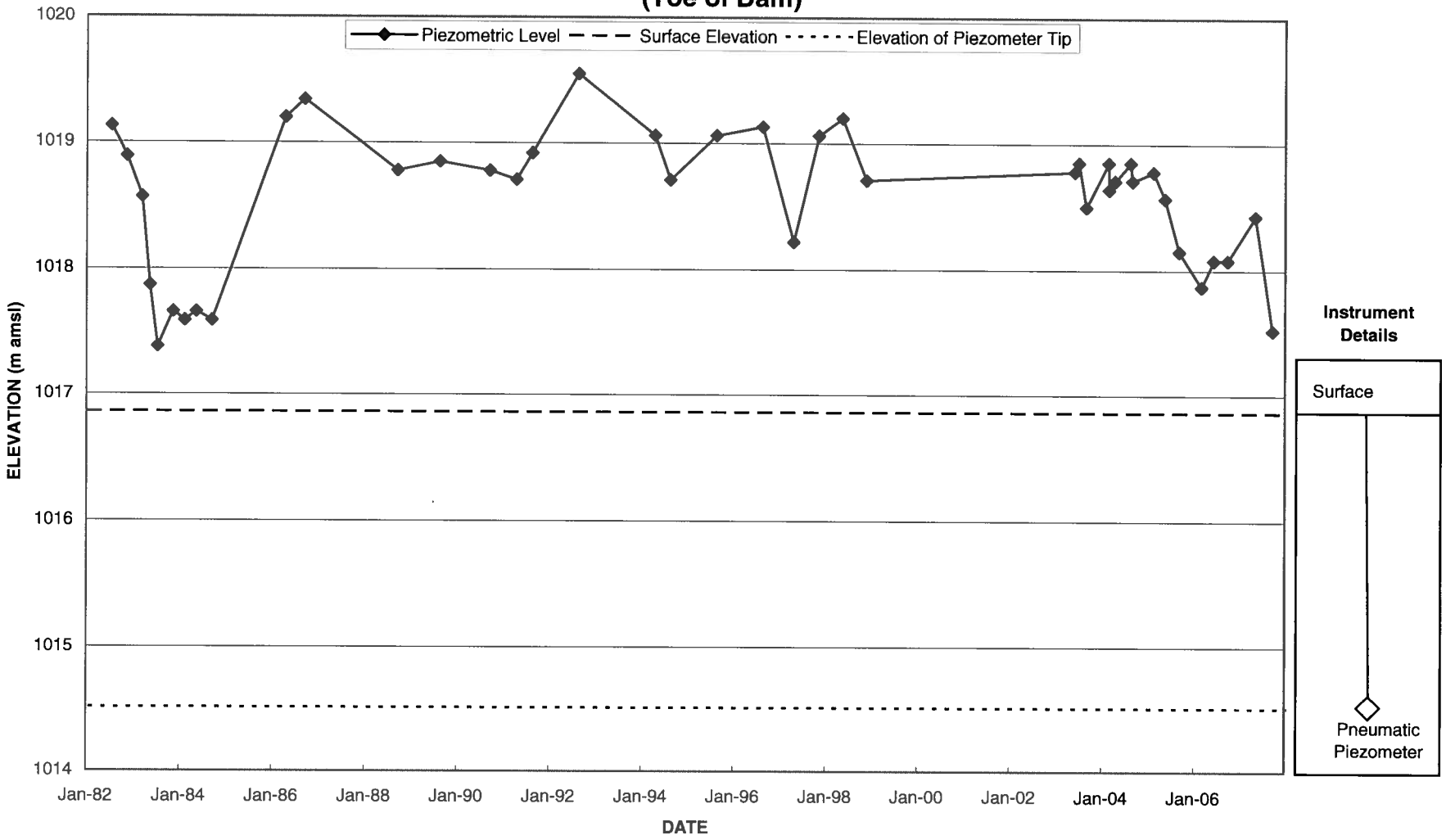


Faro Mine Instrumentation - Cross Valley Dam

CVDP-1		Location:	20m u/s of CL, Stn.0+450		
		Coordinates:	8V580128 6914135	2004 Ground Elevation (m amsl):	1016.86
Surface Protector:	yes	Date Installed:	1982	Tip Elevation (m amsl):	1014.51

Date		Reading (psi)	Piezometric Elevation (m amsl)	Pond Elevation (m amsl)	Comments
Aug-82		6.60	1019.13		
Dec-82		6.26	1018.89		
Apr-83		5.80	1018.57	1029.33	
Jun-83		4.80	1017.87	1025.88	
Aug-83		4.10	1017.38		
Dec-83		4.50	1017.66		
Mar-84		4.40	1017.59	1029.71	
Jun-84		4.50	1017.66	1026.80	
Oct-84		4.40	1017.59		
May-86		6.70	1019.20	1030.70	
Oct-86		6.90	1019.34	1030.90	
Oct-88		6.10	1018.78		
Sep-89		6.20	1018.85		
Oct-90		6.10	1018.78		
May-91		6.00	1018.71		
Sep-91		6.30	1018.92		
Sep-92		7.20	1019.55		
May-94		6.50	1019.06		
Sep-94		6.00	1018.71		
Sep-95		6.50	1019.06		
Sep-96		6.60	1019.13	1029.915	
6-May-97		5.30	1018.22		
21-Nov-97		6.50	1019.06		
27-May-98		6.70	1019.20	1031.2	
12-Nov-98					no air bubbles returned
4-Dec-98		6.0	1018.71	1029.8	
16-Dec-98				1029.8	black tube broken at connector
11-Jun-03		6.1	1018.78		new piezometer
15-Jul-03		6.2	1018.85		
10-Sep-03		5.7	1018.50		
4-Mar-04		6.2	1018.85		2004 Survey data used from here on
8-Mar-04		5.9	1018.64		
26-Apr-04		6	1018.71		
26-Aug-04		6.2	1018.85		
9-Sep-04		6	1018.71		
22-Feb-05		6.1	1018.78		
24-Feb-05		3.5			
26-May-05		5.8	1018.57		
14-Sep-05		5.2	1018.15		
9-Mar-06		4.8	1017.87		
14-Jun-06		5.1	1018.08		
2-Oct-06		5.1	1018.08	1027.468	
9-May-07		5.6	1018.43	1029.295	Good return
24-Sep-07		4.3	1017.52	1030.295	

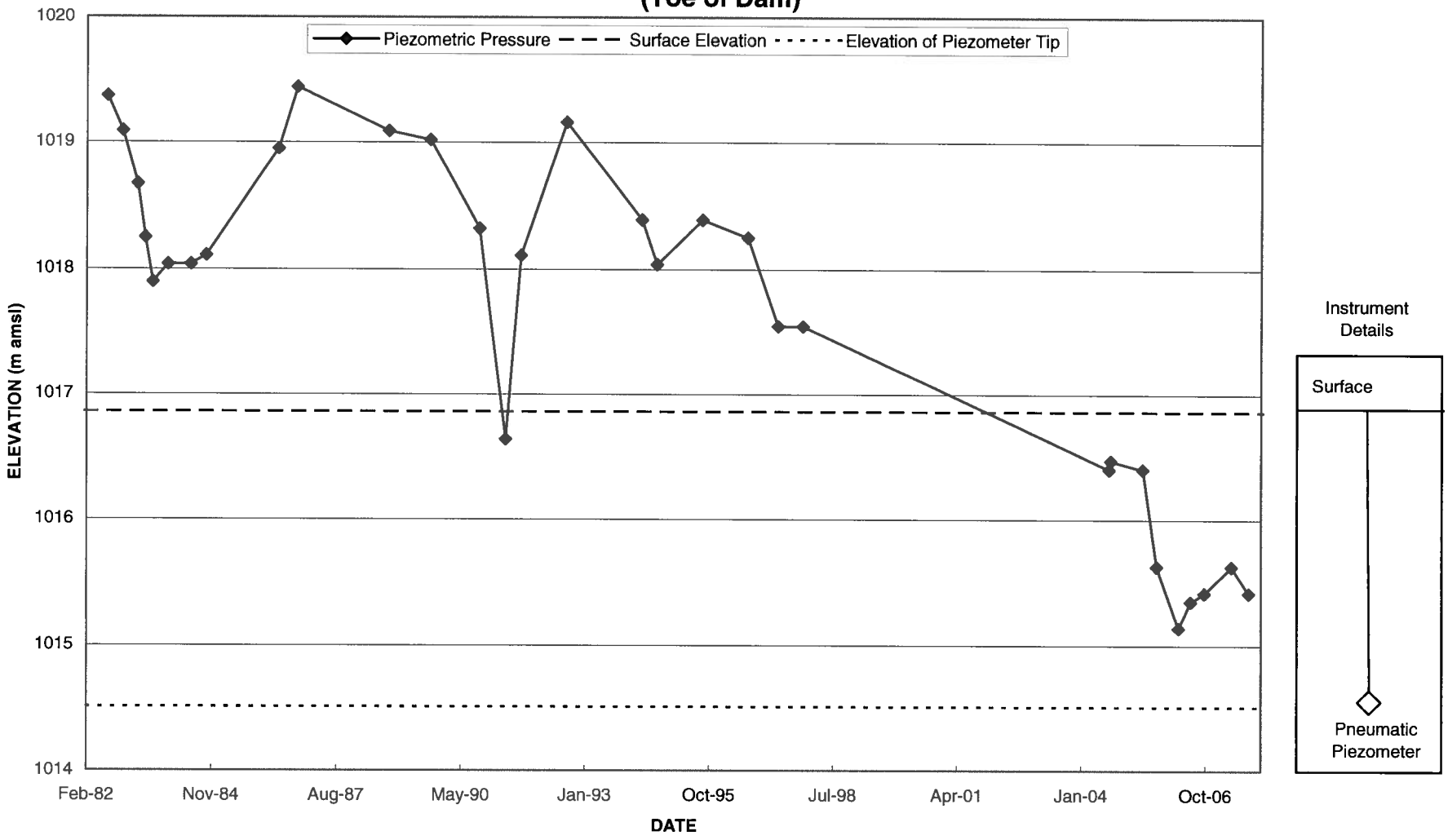
CROSS VALLEY DAM
Pieometric Monitoring
CVDP-1 Pneumatic Piezometer
(Toe of Dam)



Faro Mine Instrumentation - Cross Valley Dam

CVDP-2		Location:	Cross Valley Dam St.0+450 5m u/s of CL.		
		Coordinates:	8V580128 6914135	Ground Elevation (m amsl):	1016.86
Surface Protector:	yes	Date Installed:	1982	Tip Elevation (m amsl):	1014.51
Date		Reading (psi)	Piezometric Elevation (m amsl)	Pond Elevation (m amsl)	Comments
Aug-82		6.90	1019.37		
Dec-82		6.50	1019.09		
Apr-83		5.90	1018.67	1029.33	
Jun-83		5.30	1018.25	1025.88	
Aug-83		4.80	1017.90		
Dec-83		5.00	1018.04		
Mar-84				1029.71	
Jun-84		5.00	1018.04	1026.80	
Oct-84		5.10	1018.11		
May-86		6.30	1018.95	1030.70	
Oct-86		7.00	1019.44	1030.90	
Oct-88		6.50	1019.09		
Sep-89		6.40	1019.02		
Oct-90		5.40	1018.32		
May-91		3.00	1016.64		
Sep-91		5.10	1018.11		
Sep-92		6.60	1019.16		
May-94		5.50	1018.39		
Sep-94		5.00	1018.04		
Sep-95		5.50	1018.39		
Sep-96		5.30	1018.25	1029.915	
6-May-97		4.30	1017.55		
21-Nov-97			1017.55		Broken
10-Sep-03		16.90			Broken
4-Mar-04					Frozen
8-Mar-04		19.20			Broken
26-Aug-04		2.70	1016.40		Broken
9-Sep-04		2.80	1016.47		Broken
22-Feb-05		11.5			no bubbles, keeps rising
24-Feb-05		16			no bubbles, keeps rising
26-May-05		2.7	1016.40		
14-Sep-05		1.6	1015.63		
09-Mar-06		0.9	1015.14		
14-Jun-06		1.2	1015.35		
02-Oct-06		1.3	1015.42	1027.468	
09-May-07		1.6	1015.63	1029.295	Good Return
24-Sep-07		1.3	1015.42	1030.295	

CROSS VALLEY DAM
Pieometric Monitoring
CVDP-2 Pneumatic Piezometer
(Toe of Dam)



Faro Mine Instrumentation - Cross Valley Dam

CVDP-3		Location:	St.0+450 7m d/s of CL.		
		Coordinates:	8V580128 6914135	2004 Ground Elevation (m amsl):	1016.86
Surface Protector:	yes	Date Installed:	1982	Tip Elevation (m amsl):	1014.71

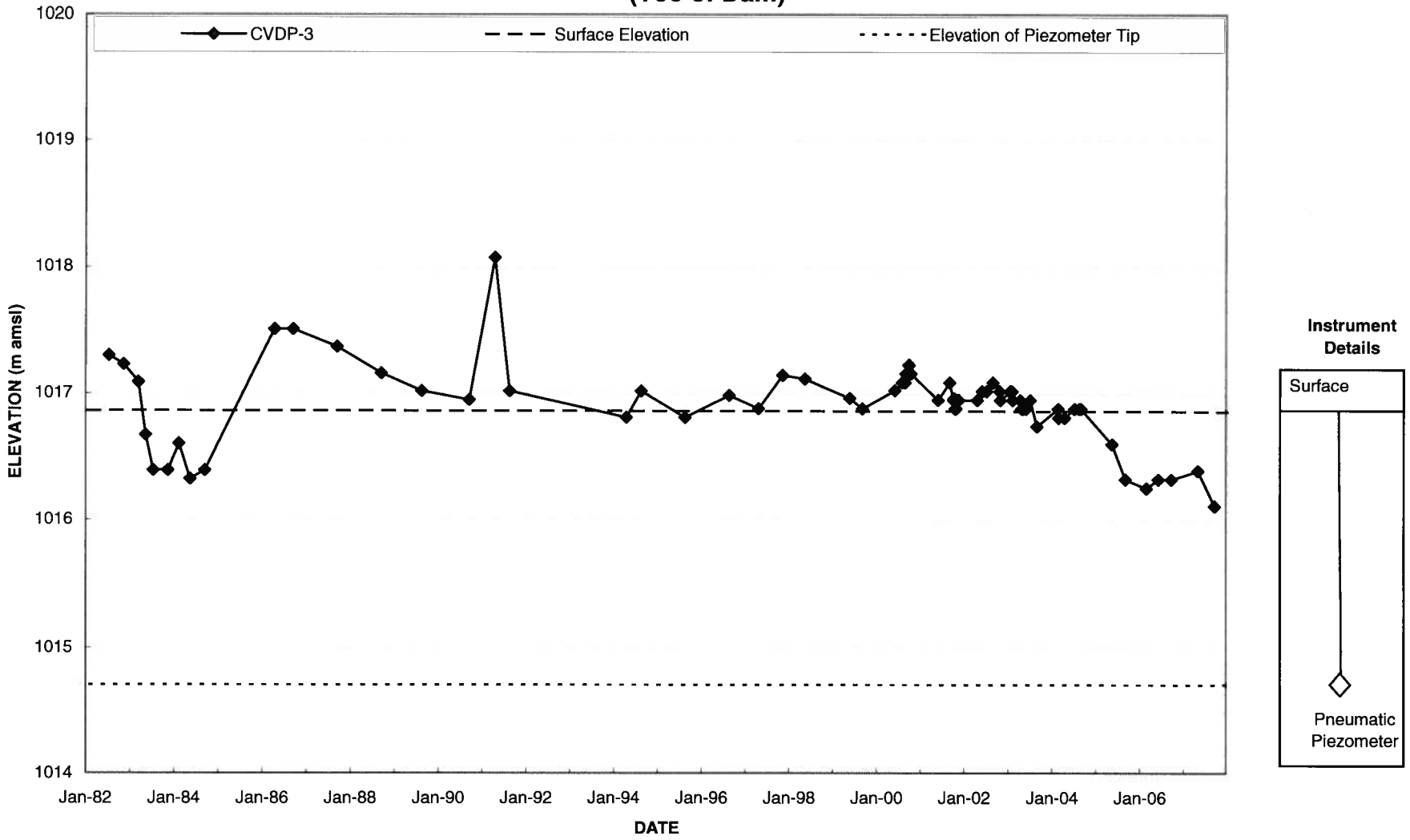
Date		Reading (psi)	Piezometric Elevation 2004 (m amsl)	Pond Elevation (m amsl)	Comments
Aug-82		3.70	1017.30		
Dec-82		3.60	1017.23		
Apr-83		3.40	1017.09	1029.33	
Jun-83		2.80	1016.67	1025.88	
Aug-83		2.40	1016.39		
Dec-83		2.40	1016.39		
Mar-84		2.70	1016.60	1029.71	
Jun-84		2.30	1016.32	1026.80	
Oct-84		2.40	1016.39		
May-86		4.00	1017.51	1030.70	
Oct-86		4.00	1017.51	1030.90	
Oct-87		3.80	1017.37		
Oct-88		3.50	1017.16		
Sep-89		3.30	1017.02		
Oct-90		3.20	1016.95		
May-91		4.80	1018.07		
Sep-91		3.30	1017.02		
Sep-92		0.40			likely erroneous reading
May-94		3.00	1016.81		
Sep-94		3.30	1017.02		
Sep-95		3.00	1016.81		
Sep-96		3.25	1016.99	1029.915	
6-May-97		3.10	1016.88		
21-Nov-97		3.48	1017.15		
27-May-98		3.44	1017.12	1031.2	
12-Nov-98		n.r.			no air bubbles returned
4-Dec-98		n.r.			no air bubbles returned
3-Jun-99		3.22	1016.96		
18-Sep-99		3.10	1016.88	1029.2	very slow
14-Jun-00		3.31	1017.03	1030.2	
14-Aug-00		3.40	1017.09		
31-Aug-00		3.40	1017.09		
7-Sep-00		3.40	1017.09		
14-Sep-00		3.50	1017.16		
21-Sep-00		3.50	1017.16		
28-Sep-00		3.50	1017.16		
6-Oct-00		3.60	1017.23		
12-Oct-00		3.60	1017.23		
20-Oct-00		3.50	1017.16		
27-Oct-00		3.50	1017.16		
10-Jun-01		3.20	1016.95		
14-Sep-01		3.40	1017.09		
16-Oct-01		3.2	1016.95		
18-Oct-01		3.2	1016.95		
19-Oct-01		3.2	1016.95		
20-Oct-01		3.22	1016.96		
21-Oct-01		3.21	1016.96		
22-Oct-01		3.2	1016.95		
25-Oct-01		3.2	1016.95		
29-Oct-01		3.1	1016.88		
1-Nov-01		3.2	1016.95		
5-Nov-01		3.1	1016.88		
6-Nov-01		3.1	1016.88		
8-Nov-01		3.2	1016.95		
12-Nov-01		3.2	1016.95		
15-Nov-01		3.2	1016.95		

Faro Mine Instrumentation - Cross Valley Dam

CVDP-3		Location:	St.0+450 7m d/s of CL.		
		Coordinates:	8V580128 6914135	2004 Ground Elevation (m amsl):	1016.86
Surface Protector:	yes	Date Installed:	1982	Tip Elevation (m amsl):	1014.71

Date		Reading (psi)	Piezometric Elevation 2004 (m amsl)	Pond Elevation (m amsl)	Comments
19-Nov-01		3.2	1016.95		
21-Nov-01		3.2	1016.95		
23-Nov-01		3.2	1016.95		pond elev approx - 8 ft.
26-Nov-01		3.2	1016.95		daytime temp -34 C
28-Nov-01					not read, low pressure in box
30-Nov-01					instrument broken from Nov 01 to Feb 02
1-May-02		3.2	1016.95		instrument fixed
12-Jun-02		3.3	1017.02		
17-Jul-02		3.3	1017.02		
7-Aug-02					not read
9-Sep-02		3.4	1017.09		
4-Nov-02		3.3	1017.02		
10-Nov-02		3.2	1016.95		
30-Jan-03		3.3	1017.02		
9-Feb-03		3.3	1017.02		start siphon
11-Feb-03		3.3	1017.02		
13-Feb-03		3.3	1017.02		
18-Feb-03		3.2	1016.95		
21-Feb-03		3.2	1016.95	1026.18	
23-Apr-03		3.2	1016.95		
7-May-03		3.1	1016.88		
16-May-03		3.1	1016.88		
11-Jun-03		3.1	1016.88		*new piezometer readout
15-Jul-03		3.2	1016.95		
10-Sep-03		2.9	1016.74		
4-Mar-04		3.1	1016.88		2004 Survey data used from here on
8-Mar-04		3	1016.81		
26-Apr-04		3	1016.81		
19-Jul-04		3.1	1016.88		
26-Aug-04		3.1	1016.88		
9-Sep-04		3.1	1016.88		
22-Feb-05		14			no bubbles, keeps rising
24-Feb-05		16			no bubbles, keeps rising
26-May-05		2.7	1016.60		
14-Sep-05		2.3	1016.32		
9-Mar-06		2.2	1016.25		
14-Jun-06		2.3	1016.32		
2-Oct-06		2.3	1016.32	1027.47	
9-May-07		2.4	1016.39	1029.295	Good Return
24-Sep-07		2	1016.11	1030.295	

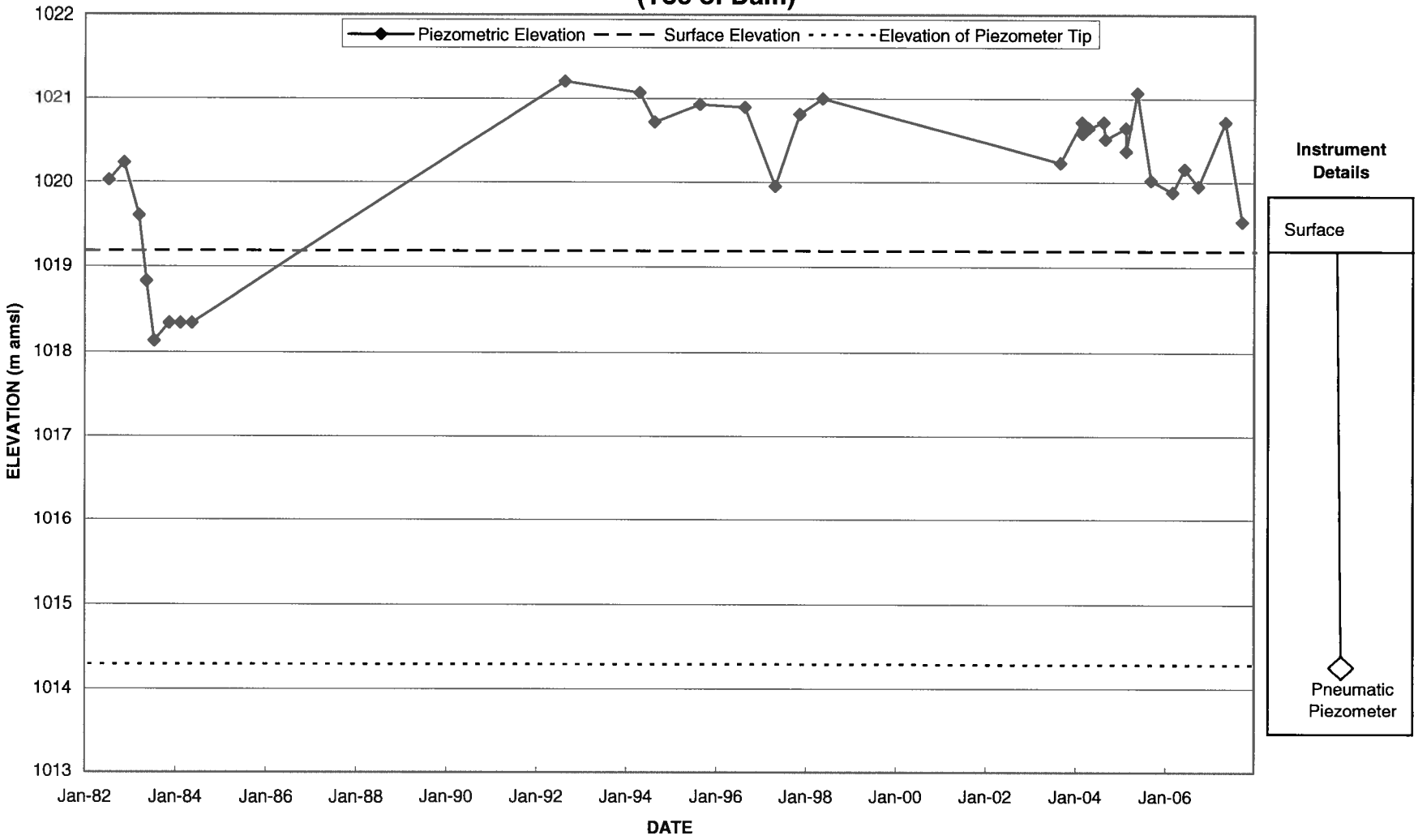
CROSS VALLEY DAM
Piezometric Monitoring
CVDP-3 Pneumatic Piezometer
(Toe of Dam)



Faro Mine Instrumentation - Cross Valley Dam

CVDP-5		Location:	Cross Valley Dam St.0+210 9m u/s of CL.		
		Coordinates:	8V580239 6914346	2004 Ground Elevation (m amsl):	1019.18
Surface Protector:	yes	Date Installed:	1982	Tip Elevation (m amsl):	1014.28
Date		Reading (psi)	Piezometric Elevation (m amsl)	Pond Elevation (m amsl)	Comments
Aug-82		8.20	1020.02		
Dec-82		8.50	1020.23		
Apr-83		7.60	1019.60	1029.33	
Jun-83		6.50	1018.83	1025.88	
Aug-83		5.50	1018.13		
Dec-83		5.80	1018.34		
Mar-84		5.80	1018.34	1029.71	
Jun-84		5.80	1018.34	1026.80	
May-86				1030.70	
Oct-86				1030.90	
Sep-92		9.90	1021.21		
May-94		9.70	1021.07		
Sep-94		9.20	1020.72		
Sep-95		9.50	1020.93		
Sep-96		9.45	1020.90	1029.915	
6-May-97		8.10	1019.95		
21-Nov-97		9.33	1020.81		
27-May-98		9.60	1021.00		
12-Nov-98					black air tube broken at connector
10-Sep-03		8.50	1020.23		
4-Mar-04		9.20	1020.72		2004 Survey data used from here o
8-Mar-04		9.00	1020.58		
26-Apr-04		9.10	1020.65		
26-Aug-04		9.20	1020.72		
9-Sep-04		8.90	1020.51		
22-Feb-05		9.1	1020.65		
24-Feb-05		8.7	1020.37		
26-May-05		9.7	1021.07		
14-Sep-05		8.2	1020.02		
9-Mar-06		8.0	1019.88		
14-Jun-06		8.4	1020.16		
2-Oct-06		8.1	1019.95	1027.468	
9-May-07		9.2	1020.72	1029.295	Good Return
24-Sep-07		7.5	1019.53	1030.295	

CROSS VALLEY DAM
Pieometric Monitoring
CVDP-5 Pneumatic Piezometer
(Toe of Dam)



Faro Mine Instrumentation - Cross Valley Dam

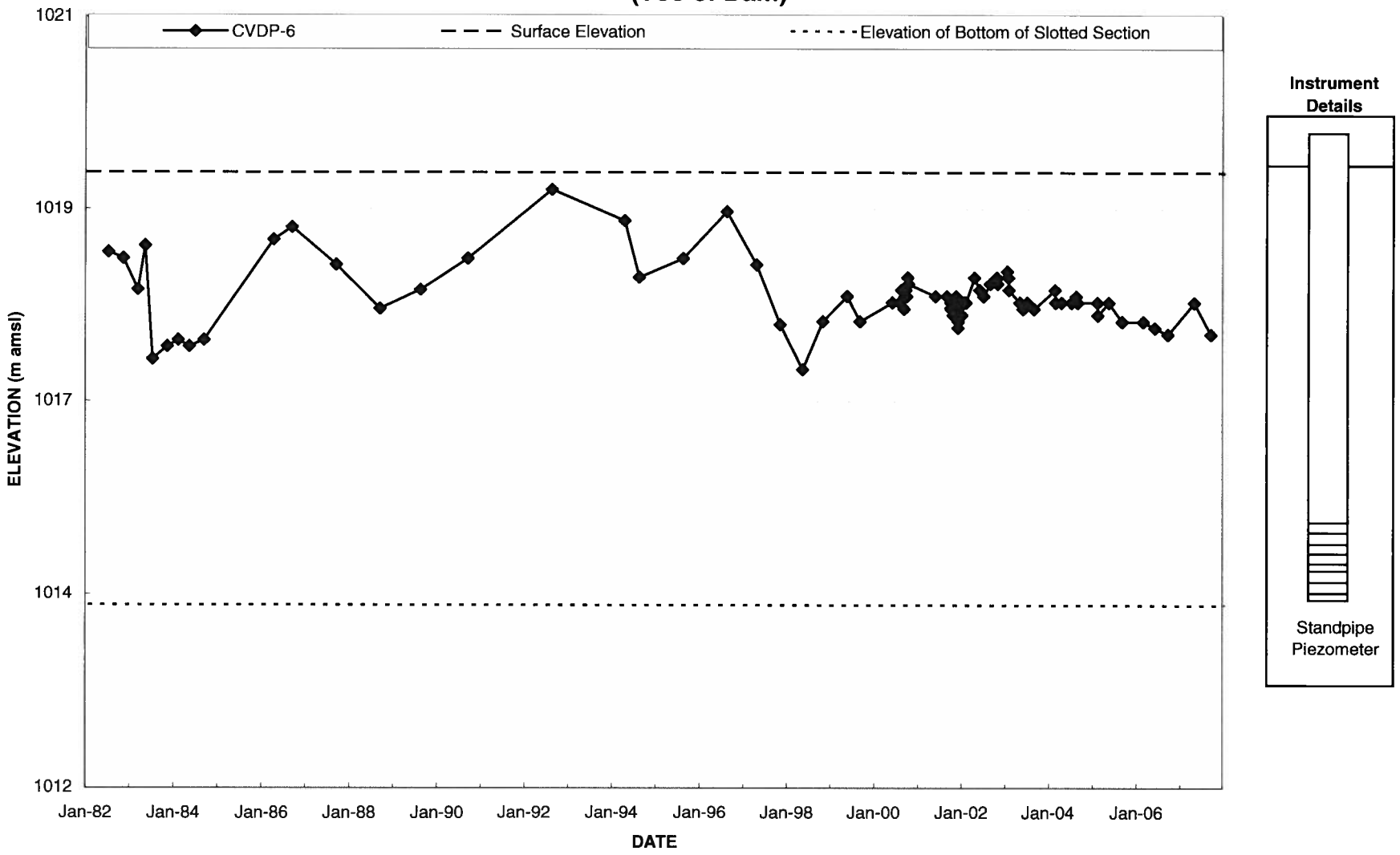
CVDP-6		Location:	St.0+210 5m d/s of CL.		
		Coordinates:	8V580239 6914346	2004 Ground Elevation (m amsl):	1019.18
Surface Protector:	yes	Date Installed:	1982	Tip Elevation (m amsl):	1014.37

Date		Reading (psi)	Piezometric Elevation 2004 (m amsl)	Pond Elevation (m amsl)	Comments
Aug-82		5.60	1018.29		
Dec-82		5.50	1018.22		
Apr-83		5.00	1017.87	1029.33	
Jun-83		5.70	1018.36	1025.88	
Aug-83		3.90	1017.1		
Dec-83		4.10	1017.24		
Mar-84		4.20	1017.31	1029.71	
Jun-84		4.10	1017.24	1026.80	
Oct-84		4.20	1017.31		
May-86		5.80	1018.43	1030.70	
Oct-86		6.00	1018.57	1030.90	
Oct-87		5.40	1018.15		
Oct-88		4.70	1017.66		
Sep-89		5.00	1017.87		
Oct-90		5.50	1018.22		
Sep-92		6.60	1018.99		
May-94		6.10	1018.64		
Sep-94		5.20	1018.01		
Sep-95		5.50	1018.22		
Sep-96		6.25	1018.745	1029.915	
6-May-97		5.40	1018.15		
21-Nov-97		4.45	1017.485		
27-May-98		3.74	1016.988	1031.2	
12-Nov-98		4.50	1017.52	1029.8	
3-Jun-99		4.90	1017.8	1031.4	
18-Sep-99		4.50	1017.52		
14-Jun-00		4.80	1017.73	1030.2	
14-Aug-00		4.80	1017.73		
31-Aug-00		5.00	1017.87		return bubbles "sputtering"
7-Sep-00		5.00	1017.87		
14-Sep-00		5.00	1017.87		
21-Sep-00		4.70	1017.66		
28-Sep-00		4.90	1017.8		
6-Oct-00		5.00	1017.87		
12-Oct-00		4.90	1017.8		
20-Oct-00		5.20	1018.01		
27-Oct-00		5.10	1017.94		
10-Jun-01		4.90	1017.8		
14-Sep-01		4.9	1017.8		
16-Oct-01		4.8	1017.73		
18-Oct-01		4.72	1017.674		
19-Oct-01		4.7	1017.66		
20-Oct-01		4.7	1017.66		
21-Oct-01		4.7	1017.66		
22-Oct-01		4.7	1017.66		
25-Oct-01		4.70	1017.66		
29-Oct-01		4.7	1017.66		
1-Nov-01		4.7	1017.66		
5-Nov-01		4.6	1017.59		
6-Nov-01		4.6	1017.59		
8-Nov-01		4.7	1017.66		
12-Nov-01		4.7	1017.66		
15-Nov-01		4.7	1017.66		
19-Nov-01		4.8	1017.73		
21-Nov-01		4.7	1017.66		
23-Nov-01		4.7	1017.66		pond elev approx - 8 ft.
26-Nov-01		-			not read
28-Nov-01		-			not read, low pressure in box
30-Nov-01		4.9	1017.8		
3-Dec-01		4.7	1017.66		
5-Dec-01		4.7	1017.66		
12-Dec-01		4.7	1017.66		

Faro Mine Instrumentation - Cross Valley Dam

CVDP-6		Location:	St.0+210 5m d/s of CL.		
		Coordinates:	8V580239 6914346	2004 Ground Elevation (m amsl):	1019.18
Surface Protector:	yes	Date Installed:	1982	Tip Elevation (m amsl):	1014.37
Date		Reading (psi)	Piezometric Elevation 2004 (m amsl)	Pond Elevation (m amsl)	Comments
14-Dec-01		4.8	1017.73		
15-Dec-01		4.4	1017.45		
16-Dec-01		4.8	1017.73		
17-Dec-01		4.8	1017.73		
18-Dec-01		4.5	1017.52		
19-Dec-01		4.8	1017.73		
26-Dec-01		4.6	1017.59		
2-Jan-02		4.8	1017.73		
9-Jan-02		4.6	1017.59		
16-Jan-02		4.6	1017.59		
23-Jan-02		4.8	1017.73		
30-Jan-02		4.8	1017.73		
6-Feb-02		4.8	1017.73		
13-Feb-02		4.8	1017.73		
20-Feb-02		4.8	1017.73		
1-May-02		5.2	1018.01		
12-Jun-02		5.0	1017.87		
17-Jul-02		4.9	1017.8		
7-Aug-02					not read
9-Sep-02		5.1	1017.94		
4-Nov-02		5.2	1018.01		
10-Nov-02		5.1	1017.94		
30-Jan-03		5.3	1018.08		
9-Feb-03		5.2	1018.01		start siphon
11-Feb-03		5.2	1018.01		
13-Feb-03		5	1017.87		
18-Feb-03					*Piezometer tip broken (-35 oC)
21-Feb-03				1026.18	
23-Apr-03					
7-May-03					
16-May-03		4.8	1017.73		*piezometer tip repaired
11-Jun-03		4.7	1017.66		*new piezometer readout
15-Jul-03		4.8	1017.73		
10-Sep-03		4.7	1017.66		
4-Mar-04		5	1017.87		2004 Survey data used from here on
8-Mar-04		4.8	1017.73		
26-Apr-04		4.8	1017.73		
19-Jul-04		4.8	1017.73		
26-Aug-04		4.9	1017.80		
9-Sep-04		4.8	1017.73		
22-Feb-05		4.8	1017.73		
24-Feb-05		4.6	1017.59		
24-Feb-05		4.6	1017.59		
26-May-05		4.8	1017.73		
14-Sep-05		4.5	1017.52		
09-Mar-06		4.5	1017.52		
14-Jun-06		4.4	1017.45		
02-Oct-06		4.3	1017.38	1027.468	
09-May-07		4.8	1017.73	1029.295	Good Return
24-Sep-07		4.3	1017.38	1030.295	

CROSS VALLEY DAM
Piezometric Monitoring
CVDP-6 Pneumatic Piezometer
(Toe of Dam)



Faro Mine Instrumentation - Cross Valley Dam

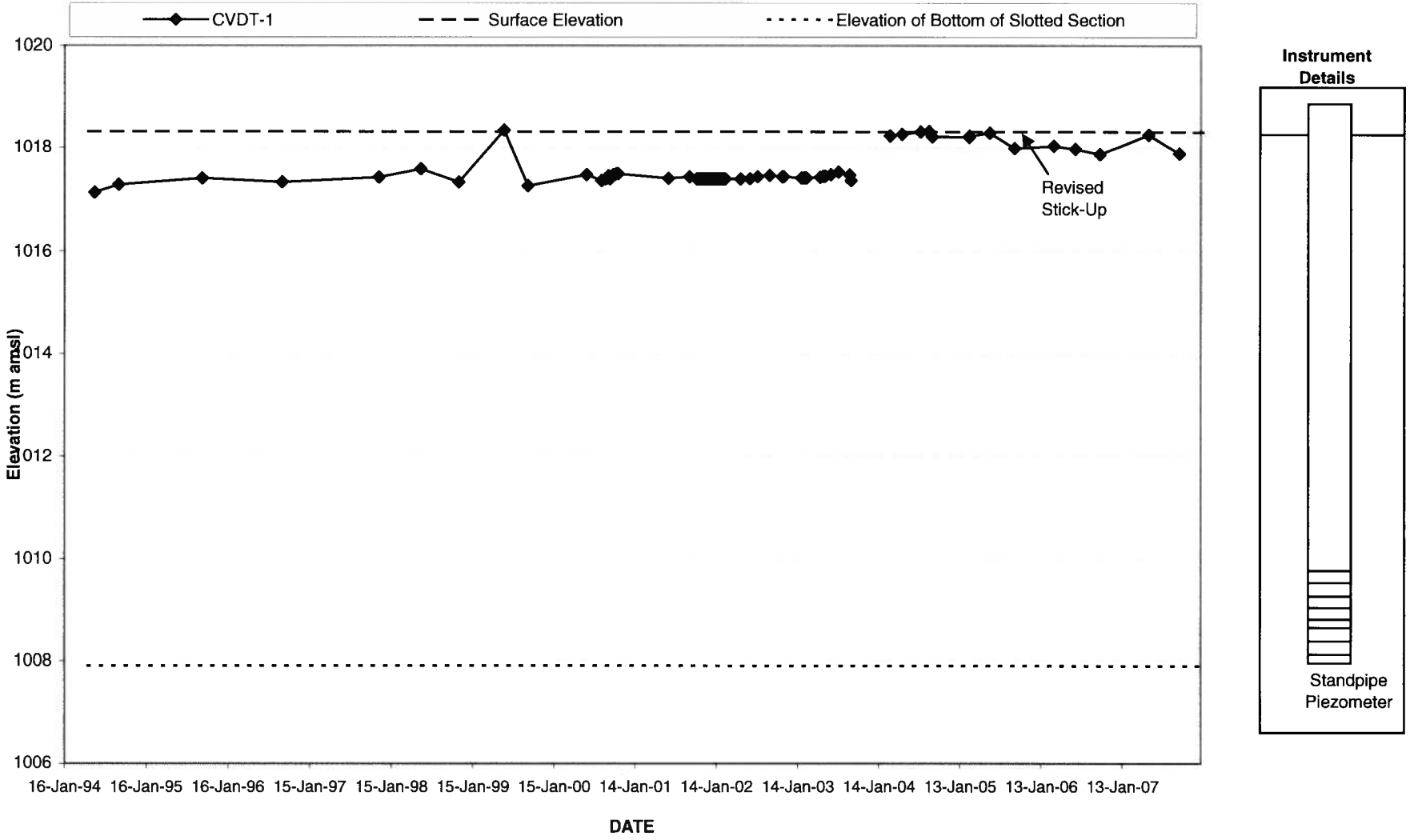
CVDT-1		Location:	Cross Valley Dam Toe, black PVC adj. to X11 channel	2004 Stick-up (m):	0.27
		Coordinates:	8V580219 6914353	2004 Ground Elevation (m amsl):	1018.30
Surface Protector:	N/A	Date Installed:	1994	2004 Tip Elevation (m amsl):	1007.90

Date		Water Level from top of pipe (m)	Piezometric Elevation (m amsl)	Pond Elevation (m amsl)	Comments
31-May-94		-2.07	1017.13		
15-Sep-94		-1.92	1017.28		
22-Sep-95		-1.80	1017.40		
13-Sep-96		-1.87	1017.33	1029.915	
20-Nov-97		-1.78	1017.42		
26-May-98		-1.62	1017.58	1031.20	
13-Nov-98		-1.87	1017.33	1029.80	
3-Jun-99		-0.868	1018.33	1031.40	
18-Sep-99		-1.940	1017.26	~1029.2	
8-Jun-00		-1.73	1017.47	~1030.2	
14-Aug-00		-1.84	1017.36		
31-Aug-00		-1.81	1017.39		
7-Sep-00		-1.80	1017.40		
14-Sep-00		-1.75	1017.45		
21-Sep-00		-1.81	1017.39		
28-Sep-00		-1.76	1017.44		
6-Oct-00		-1.73	1017.47		
12-Oct-00		-1.73	1017.47		
20-Oct-00		-1.71	1017.49		
27-Oct-00		-1.71	1017.49		
10-Jun-01		-1.80	1017.40		
14-Sep-01		-1.77	1017.43		
16-Oct-01		-1.81	1017.39		
18-Oct-01		-1.81	1017.39		
19-Oct-01		-1.81	1017.39		
20-Oct-01		-1.81	1017.39		
21-Oct-01		-1.81	1017.39		
22-Oct-01		-1.81	1017.39		
25-Oct-01		-1.81	1017.39		
29-Oct-01		-1.81	1017.39		
1-Nov-01		-1.81	1017.39		
5-Nov-01		-1.81	1017.39		
6-Nov-01		-0.44	1017.39		Stick up changed
8-Nov-01		-0.44	1017.39		
12-Nov-01		-0.44	1017.39		
15-Nov-01		-0.44	1017.39		
19-Nov-01		-0.44	1017.39		
21-Nov-01		-0.44	1017.39		
23-Nov-01		-0.44	1017.39		pond elev approx - 8 ft.
26-Nov-01		-0.44	1017.39		daytime temp -34 C
28-Nov-01		-0.44	1017.39		
30-Nov-01		-0.44	1017.39		
3-Dec-01		-0.44	1017.39		
5-Dec-01		-0.44	1017.39		
12-Dec-01		-0.44	1017.39		
14-Dec-01		-0.44	1017.39		
15-Dec-01		-0.44	1017.39		
16-Dec-01		-0.44	1017.39		
17-Dec-01		-0.44	1017.39		
18-Dec-01		-0.44	1017.39		
19-Dec-01		-0.44	1017.39		
26-Dec-01		-0.44	1017.39		
2-Jan-02		-0.44	1017.39		
9-Jan-02		-0.44	1017.39		
16-Jan-02		-0.44	1017.39		

Faro Mine Instrumentation - Cross Valley Dam

CVDT-1		Location:	Cross Valley Dam Toe, black PVC adj. to X11 channel	2004 Stick-up (m):	0.27
		Coordinates:	8V580219 6914353	2004 Ground Elevation (m amsl):	1018.30
Surface Protector:	N/A	Date Installed:	1994	2004 Tip Elevation (m amsl):	1007.90
Date		Water Level from top of pipe (m)	Piezometric Elevation (m amsl)	Pond Elevation (m amsl)	Comments
23-Jan-02		-0.44	1017.39		
30-Jan-02		-0.44	1017.39		
6-Feb-02		-0.44	1017.39		
13-Feb-02		-0.44	1017.39		
20-Feb-02		-0.44	1017.39		
1-May-02		-0.44	1017.39		
12-Jun-02		-0.435	1017.40		
17-Jul-02		-0.395	1017.44		
7-Aug-02					not read
9-Sep-02		-0.37	1017.46		
4-Nov-02		-0.395	1017.44		
10-Nov-02		-0.395	1017.44		
30-Jan-03		-0.42	1017.41		
9-Feb-03		-0.42	1017.41	1058.60	start siphon
11-Feb-03		-0.42	1017.41	1058.50	
13-Feb-03		-0.42	1017.41	1058.50	
18-Feb-03		-0.42	1017.41		
21-Feb-03		-0.42	1017.41	1058.48	
23-Apr-03		-0.405	1017.43	1030.14	
7-May-03		-0.39	1017.44		
16-May-03		-0.385	1017.45		
11-Jun-03		-0.355	1017.48		
15-Jul-03		-0.305	1017.53		
4-Sep-03		-0.36	1017.47		
10-Sep-03		-0.465	1017.37	996.28	
4-Mar-04		-0.345	1018.23		2004 survey data use from here on
8-Mar-04					Pulled ice and snow
26-Apr-04		-0.315	1018.26	997.85	
19-Jul-04		-0.27	1018.30		
26-Aug-04		-0.26	1018.31		
9-Sep-04		-0.36	1018.21		
22-Feb-05		-0.37	1018.20		Frozen
24-Feb-05		-0.35	1018.22		Frozen
26-May-05		-0.29	1018.28		
14-Sep-05		-0.585	1017.99		
9-Mar-06		-0.54	1018.03		no beep
14-Jun-06		-0.6	1017.97		
2-Oct-06		-0.7	1017.87	1027.468	
9-May-07		-0.325	1018.25	1029.295	
24-Sep-07		-0.685	1017.89	1030.295	

CROSS VALLEY DAM
Piezometric Monitoring
CVDT-1 Standpipe Piezometer
(Toe of Dam)



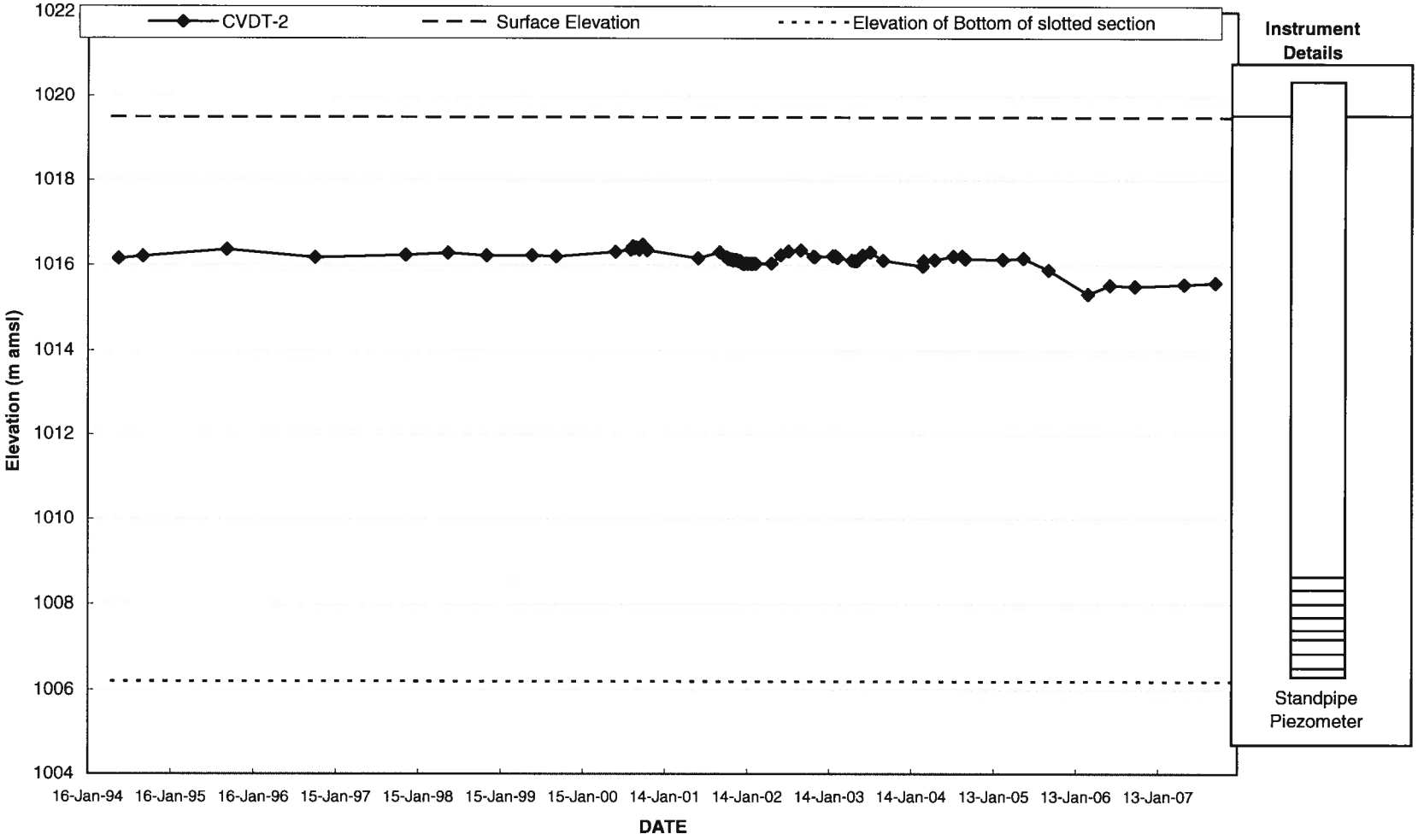
Faro Mine Instrumentation - Cross Valley Dam

CVDT-2		Location:	Cross Valley Dam Toe black PVC adj. to W3 channel	Stick up:	1.52m/ 0.38m
		Coordinates:	N/A	Ground Elevation (m amsl):	1019.50
Surface Protector:	N/A	Date Installed:	1994	Tip Elevation (m amsl):	1006.20
Date		Water level from top of pipe (m)	Piezometric Elevation (m amsl)	Pond Elevation (m amsl)	Comments
31-May-94		-4.86	1016.16		
15-Sep-94		-4.81	1016.21		
21-Sep-95		-4.65	1016.37		
15-Oct-96		-4.84	1016.18	1029.915	
20-Nov-97		-4.78	1016.24		
26-May-98		-4.73	1016.29	1031.20	
13-Nov-98		-4.79	1016.23	1029.80	
3-Jun-99		-4.784	1016.24	1031.40	
18-Sep-99		-4.81	1016.21	~1029.2	
8-Jun-00		-4.70	1016.32	~1030.2	
14-Aug-00		-4.65	1016.37		
24-Aug-00		-4.57	1016.45		
31-Aug-00		-4.62	1016.40		
7-Sep-00		-4.60	1016.42		
14-Sep-00		-4.61	1016.41		
21-Sep-00		-4.65	1016.37		
28-Sep-00		-4.60	1016.42		
6-Oct-00		-4.53	1016.49		
12-Oct-00		-4.59	1016.43		
20-Oct-00		-4.61	1016.41		
27-Oct-00		-4.66	1016.36		
10-Jun-01		-4.85	1016.17		
14-Sep-01		-4.71	1016.31		
16-Oct-01		-4.83	1016.19		
18-Oct-01		-4.85	1016.17		
19-Oct-01		-4.86	1016.16		
20-Oct-01		-4.86	1016.16		
21-Oct-01		-4.86	1016.16		
22-Oct-01		-4.86	1016.16		
25-Oct-01		-4.87	1016.15		
29-Oct-01		-4.87	1016.15		
1-Nov-01		-4.875	1016.15		
5-Nov-01		-4.88	1016.14		
6-Nov-01		-3.74	1016.14		New stick-up of 0.38 m
8-Nov-01		-3.74	1016.14		
12-Nov-01		-3.76	1016.12		
15-Nov-01		-3.76	1016.12		
19-Nov-01		-3.755	1016.13		
21-Nov-01		-3.75	1016.13		
23-Nov-01		-3.75	1016.13		pond elev approx - 8 ft.
26-Nov-01		-3.75	1016.13		daytime temp -34 C
28-Nov-01		-3.76	1016.12		
30-Nov-01		-3.76	1016.12		
3-Dec-01		-3.76	1016.12		
5-Dec-01		-3.775	1016.11		
12-Dec-01		-3.775	1016.11		
14-Dec-01		-3.775	1016.11		
15-Dec-01		-3.8	1016.08		
16-Dec-01		-3.79	1016.09		
17-Dec-01		-3.81	1016.07		
18-Dec-01		-3.815	1016.07		
19-Dec-01		-3.82	1016.06		
26-Dec-01		-3.84	1016.04		
2-Jan-02		-3.84	1016.04		
9-Jan-02		-3.835	1016.05		

Faro Mine Instrumentation - Cross Valley Dam

CVDT-2		Location:	Cross Valley Dam Toe black PVC adj. to W3 channel	Stick up:	1.52m/ 0.38m
		Coordinates:	N/A	Ground Elevation (m amsl):	1019.50
Surface Protector:	N/A	Date Installed:	1994	Tip Elevation (m amsl):	1006.20
Date		Water level from top of pipe (m)	Piezometric Elevation (m amsl)	Pond Elevation (m amsl)	Comments
16-Jan-02		-3.84	1016.04		
23-Jan-02		-3.83	1016.05		
30-Jan-02		-3.84	1016.04		
6-Feb-02		-3.84	1016.04		
13-Feb-02		-3.83	1016.05		
20-Feb-02		-3.84	1016.04		
1-May-02		-3.83	1016.05		
12-Jun-02		-3.64	1016.24		
17-Jul-02		-3.545	1016.34		
7-Aug-02					not read
9-Sep-02		-3.52	1016.36		
4-Nov-02		-3.67	1016.21		
10-Nov-02		-3.68	1016.20		
30-Jan-03		-3.655	1016.23		
9-Feb-03		-3.66	1016.22	1058.60	start siphon
11-Feb-03		-3.665	1016.22	1058.50	
13-Feb-03		-3.675	1016.21	1058.50	
18-Feb-03		-3.69	1016.19		
21-Feb-03		-3.695	1016.19	1026.18	
23-Apr-03		-3.76	1016.12	997.84	
7-May-03		-3.775	1016.11		
16-May-03		-3.775	1016.11		
11-Jun-03		-3.64	1016.24		
15-Jul-03		-3.57	1016.31		
10-Sep-03		-3.76	1016.12		
4-Mar-04		-3.9	1015.98		No 2004 survey data available
8-Mar-04		-3.77	1016.11		
26-Apr-04		-3.75	1016.13		
19-Jul-04		-3.665	1016.215		
26-Aug-04		-3.655	1016.225		
9-Sep-04		-3.72	1016.16		
22-Feb-05		-3.735	1016.145		
24-Feb-05		-3.745	1016.135		
26-May-05		-3.71	1016.17		
14-Sep-05		-3.99	1015.89		
9-Mar-06		-4.17	1015.33		
14-Jun-06		-3.965	1015.54		
2-Oct-06		-3.99	1015.51	1027.47	
9-May-07		-3.945	1015.56	1029.295	
24-Sep-07		-3.905	1015.60	1030.295	

CROSS VALLEY DAM
Piezometric Monitoring
CVDT-2 Standpipe Piezometer
(Toe of Dam)



Faro Mine Instrumentation - Cross Valley Dam

94CVDC-1		Location:	Cross Valley Dam Crest Stn. 0+215	2004 Stick-up (m):	0.64
		Coordinates:	8V580263 6914326	2004 Ground Elevation (m amsl):	1033.38
Surface Protector:	yes	Date Installed:	1994	2004 Tip Elevation (m amsl):	1020.4

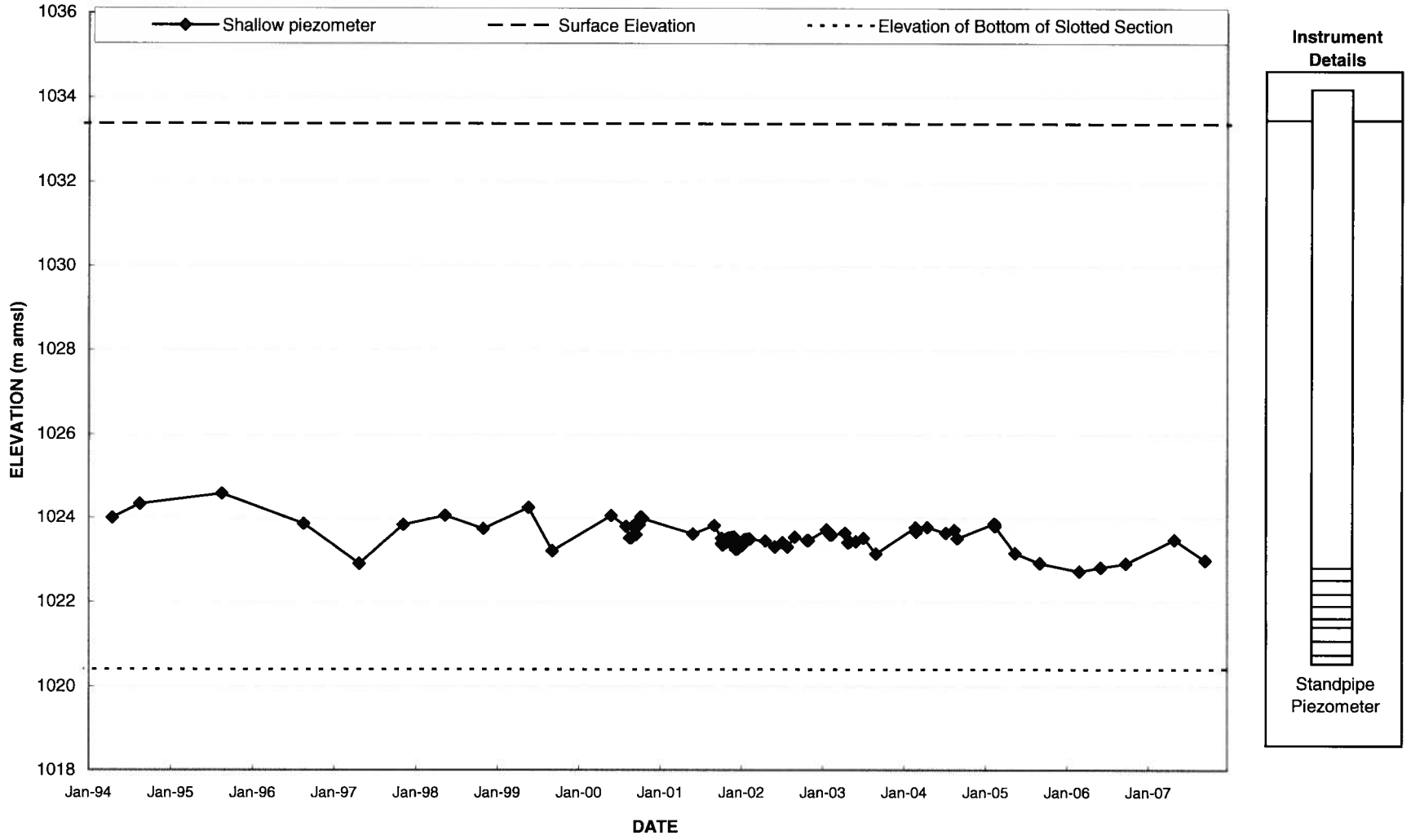
Date		Water Level from top of pipe (m)	Piezometric Elevation (m amsl)	Pond Elevation (m amsl)	Comments
May-94		9.90	1024.00		
Sep-94		9.57	1024.33		
Sep-95		9.32	1024.58		
Sep-96		10.04	1023.86	1029.915	
7-May-97		11.00	1022.91		
20-Nov-97		10.07	1023.83		
26-May-98		9.84	1024.06	1031.2	
13-Nov-98		10.16	1023.74	1029.8	
3-Jun-99		9.650	1024.25	1031.4	
18-Sep-99		10.69	1023.21	~1029.2	
8-Jun-00		9.84	1024.06	~1030.2	
14-Aug-00		10.10	1023.80		
31-Aug-00		10.38	1023.52		
7-Sep-00		10.38	1023.52		
14-Sep-00		10.10	1023.80		
21-Sep-00		13.61			frozen?
28-Sep-00		10.30	1023.60		
6-Oct-00		9.99	1023.91		
12-Oct-00		10.06	1023.84		
20-Oct-00		9.87	1024.03		
27-Oct-00		9.91	1023.99		
10-Jun-01		10.28	1023.62		
14-Sep-01		10.08	1023.82		
16-Oct-01		10.39	1023.51		
18-Oct-01		10.51	1023.39		
19-Oct-01		10.53	1023.37		
20-Oct-01		10.54	1023.36		
21-Oct-01		10.55	1023.35		
22-Oct-01		10.53	1023.37		
25-Oct-01		10.53	1023.37		
29-Oct-01		10.44	1023.46		
1-Nov-01		10.425	1023.48		
5-Nov-01		10.485	1023.42		
6-Nov-01		10.485	1023.42		
8-Nov-01		10.41	1023.49		
12-Nov-01		10.41	1023.49		
15-Nov-01		10.39	1023.51		
19-Nov-01		10.38	1023.52		
21-Nov-01		10.375	1023.53		
23-Nov-01		10.42	1023.48		pond elev approx - 8 ft.
26-Nov-01		10.42	1023.48		daytime temp -34 C
28-Nov-01		10.39	1023.51		
30-Nov-01		10.37	1023.53		
3-Dec-01		10.37	1023.53		
5-Dec-01		10.365	1023.54		
12-Dec-01		10.36	1023.54		
14-Dec-01		10.42	1023.48		
15-Dec-01		10.48	1023.42		
16-Dec-01		10.53	1023.37		
17-Dec-01		10.59	1023.31		
18-Dec-01		10.62	1023.28		
19-Dec-01		10.65	1023.25		
26-Dec-01		10.64	1023.26		
2-Jan-02		10.56	1023.34		
9-Jan-02		10.57	1023.33		
16-Jan-02		10.56	1023.34		
23-Jan-02		10.43	1023.47		
30-Jan-02		10.42	1023.48		
6-Feb-02		10.42	1023.48		
13-Feb-02		10.41	1023.49		
20-Feb-02		10.41	1023.49		

Faro Mine Instrumentation - Cross Valley Dam

94CVDC-1		Location:	Cross Valley Dam Crest Stn. 0+215	2004 Stick-up (m):	0.64
		Coordinates:	8V580263 6914326	2004 Ground Elevation (m amsl):	1033.38
Surface Protector:	yes	Date Installed:	1994	2004 Tip Elevation (m amsl):	1020.4

Date		Water Level from top of pipe (m)	Piezometric Elevation (m amsl)	Pond Elevation (m amsl)	Comments
1-May-02		10.45	1023.45		
12-Jun-02		10.59	1023.31		
17-Jul-02		10.485	1023.42		
7-Aug-02		10.595	1023.31		
9-Sep-02		10.36	1023.54		
4-Nov-02		10.435	1023.47		
10-Nov-02		10.44	1023.46		
30-Jan-03		10.18	1023.72		
9-Feb-03		10.235	1023.67		start siphon
11-Feb-03		10.235	1023.67		
13-Feb-03		10.275	1023.63		
18-Feb-03		10.31	1023.59		
21-Feb-03		10.31	1023.59	1026.18	
23-Apr-03		10.26	1023.64		
7-May-03		10.485	1023.42		
16-May-03		10.47	1023.43		
11-Jun-03		10.465	1023.44		
15-Jul-03		10.38	1023.52		
10-Sep-03		10.755	1023.15		
4-Mar-04		10.25	1023.77		2004 Survey data used from here on.
8-Mar-04		10.355	1023.67		
26-Apr-04		10.24	1023.78		
19-Jul-04		10.38	1023.64		
26-Aug-04		10.305	1023.72		
9-Sep-04		10.51	1023.51		
22-Feb-05		10.15	1023.87		
23-Feb-05		10.175	1023.85		
24-Feb-05		10.215	1023.81		
26-May-05		10.865	1023.16		dirty
14-Sep-05		11.095	1022.93		
9-Mar-06		11.29	1022.73		
14-Jun-06		11.195	1022.83		
4-Oct-06		11.105	1022.92	1027.47	
9-May-07		10.54	1023.48	1029.295	
24-Sep-07		11.03	1022.99	1030.295	

CROSS VALLEY DAM
Piezometric Monitoring
BH94 CVDC-1 Standpipe Piezometer
(Dam Crest)

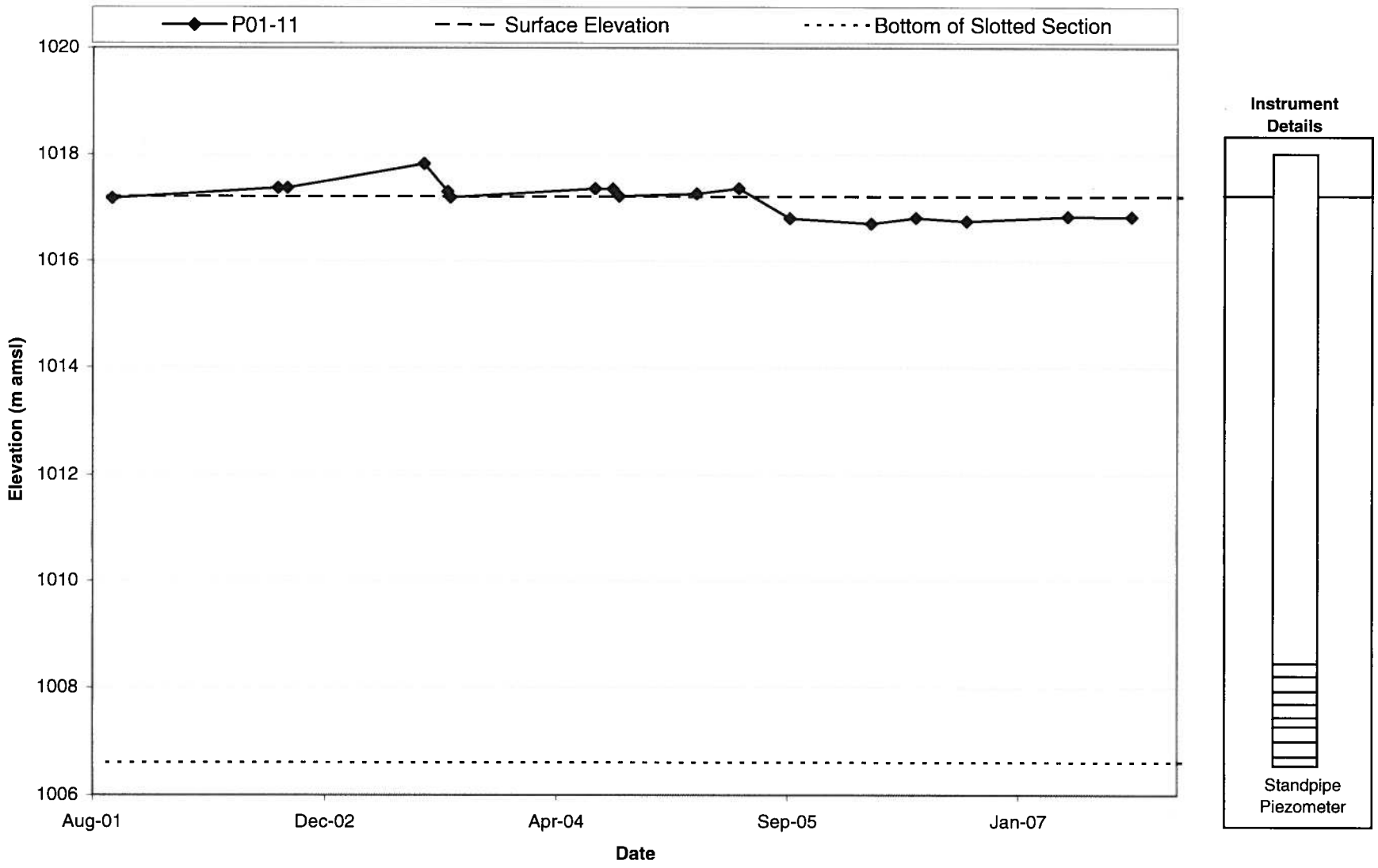


Faro Mine Instrumentation - Cross Valley Dam

P01-11		Location:	Cross Valley Dam Toe	2004 Stick-Up (m):	0.66
		Coordinates:	8V580208 6914301	2004 Surface Elevation (m amsl):	1017.21
Surface Protector:	yes	Date Installed:	2001	Tip Elevation (m amsl):	1006.61
				Screened Interval (m bgs):	9.15 - 10.67

Date		Water level from top of pipe (m)	Piezometric Elevation (m amsl)		Comments
11-Sep-01		0.65	1017.18		
3-Sep-02		0.45	1017.38		
23-Sep-02		0.45	1017.38		
15-Jul-03		0.00	1017.83		*whole casing filled with water
4-Sep-03		0.52	1017.31		* Rhonda noted: 'water in casing'
10-Sep-03		0.63	1017.20		
19-Jul-04		0.505	1017.37		2004 survey data used from here on
26-Aug-04		0.51	1017.36		
9-Sep-04		0.65	1017.22		Ice in tubing, sulphur smell
24-Feb-05		0.6	1017.27		Frozen
26-May-05		0.5	1017.37		
14-Sep-05		1.06	1016.81		
9-Mar-06		1.16	1016.71		
14-Jun-06		1.05	1016.82		Water in casing
2-Oct-06		1.12	1016.75		
9-May-07		1.03	1016.84		Good Return
24-Sep-07		1.035	1016.84		

CROSS VALLEY DAM
Piezometric Monitoring
P01-11 (2001 - GLL Monitoring Well)



THERMISTORS

Faro Mine Instrumentation
Cross Valley Dam

CVDC-6		Location:	Stn 0+340, Cross Valley Dam Crest	Elevation (m amsl):	1033.3	Coordinates:	2182.1 m N 4.7 m E	8V580210 6914218	
		Date Installed:	1981	Thermistor Type:	Cantec Controls YSI 44007	Ice-Bath Calibration:	applied	Surface Protector:	yes
Thermistor String #32		Depth Correction:	0						

Depth on String	Actual Depth	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)
(m)	(m)	09-Dec-81	30-May-94	15-Sep-94	22-Sep-95	13-Sep-96	20-Sep-99	07-Jun-00	05-Sep-00	26-Jun-01	14-Sep-01	16-Oct-01	18-Oct-01	01-May-02
15.0	-15.0	11.05	13.87	14.23	15.64	All readings	14.22	14.27	14.55	14.61	14.63	16.26	14.11	14.26
17.0	-17.0	11.70	13.95	15.22	15.74	fluctuating		14.54	14.79	14.82	14.91	16.48	14.94	14.54
19.0	-19.0	12.59	13.81	14.63	15.59		14.01	14.29	14.50	14.49	14.60	16.12	14.57	14.18
21.0	-21.0	13.48	18.73	19.53	20.59		21.25	22.11	22.55	22.63	22.75	24.31	22.82	22.39
23.0	-23.0	14.16	13.80	14.26	14.97		14.00	14.31	14.54	14.16	14.18	15.02	14.17	13.69
25.0	-25.0	15.37	13.96	14.42	14.97		14.21	14.45	14.62	14.19	14.27	15.09	14.28	13.70
27.0	-27.0	15.42	14.26	14.91	15.29		14.55	14.80	14.96	14.96	14.97	15.81	15.00	14.69
29.0	-29.0	15.35	14.46	14.14	15.44		14.86	15.12	15.22	16.01	16.15	17.05	16.25	16.33

* The initial reading (Nov 15/81) is excluded from data set because post-installation equilibrium may not have been complete.

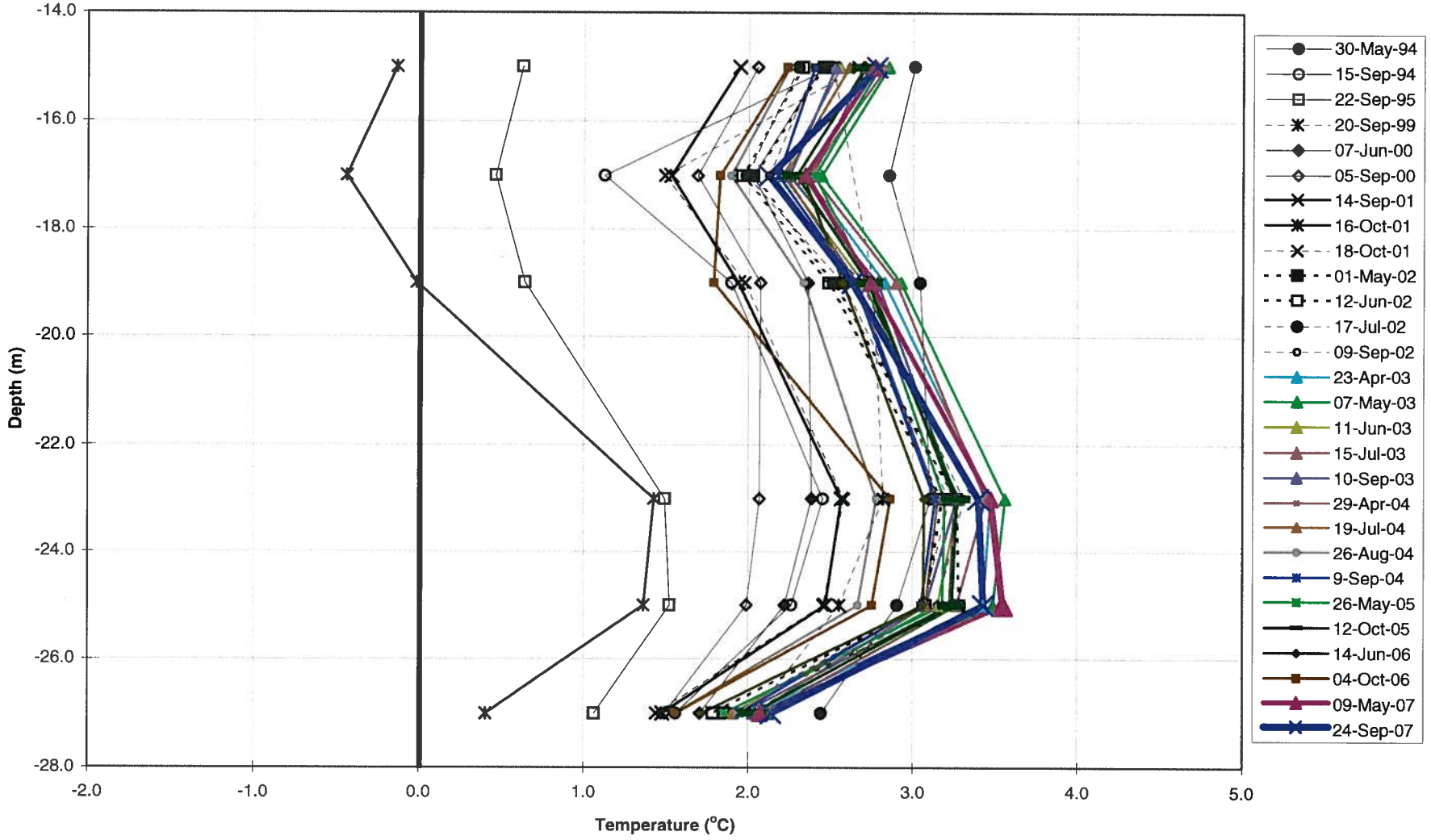
Depth on String	Actual Depth	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)
(m)	(m)	09-Dec-81	30-May-94	15-Sep-94	22-Sep-95	13-Sep-96	20-Sep-99	07-Jun-00	05-Sep-00	26-Jun-01	14-Sep-01	16-Oct-01	18-Oct-01	01-May-02
15.0	-15.0	7.60	3.01	2.50	0.63		2.51	2.44	2.06	1.97	1.95	-0.13	2.67	2.46
17.0	-17.0	6.40	2.85	1.12	0.46			2.03	1.69	1.65	1.53	-0.44	1.49	2.03
19.0	-19.0	4.90	3.04	1.90	0.64		2.76	2.36	2.07	2.09	1.94	-0.02	1.98	2.52
21.0	-21.0													
23.0	-23.0	2.60	3.11	2.46	1.49		2.82	2.39	2.07	2.60	2.57	1.43	2.58	3.27
25.0	-25.0	1.00	2.91	2.26	1.52		2.56	2.22	1.99	2.58	2.47	1.36	2.46	3.28
27.0	-27.0	0.90	2.45	1.56	1.06		2.05	1.71	1.50	1.50	1.48	0.41	1.44	1.86
29.0	-29.0													

The -21 and -29 metre depth tips are suspect

Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)
12-Jun-02	17-Jul-02	09-Sep-02	23-Apr-03	07-May-03	11-Jun-03	15-Jul-03	10-Sep-03	29-Apr-04	19-Jul-04	26-Aug-04	09-Sep-04	26-May-05	12-Oct-05	14-Jun-06	04-Oct-06	09-May-07	24-Sep-07
14.35	14.37	14.30	14.03	13.98	14.19	14.08	14.21	13.99	14.15	14.41	14.30	14.02	14.08	14.03	14.42	14.04	14.03
14.59	14.57	14.47	14.31	14.24	14.41	14.28	14.38	14.30	14.40	14.64	14.43	14.27	14.35	14.32	14.69	14.31	14.47
14.20	14.14	14.06	13.96	13.89	14.05	13.91	13.99	14.02	14.08	14.31	14.09	14.03	14.03	14.14	14.71	14.02	14.1
22.43	22.43	22.44	22.74	22.70	22.29	22.98	23.29	24.02	24.55	24.98	24.81	26.06	26.70	28.20	30.07	33.33	36.1
13.75	13.72	13.66	13.55	13.49	13.68	13.57	13.69	13.70	13.77	14.03	13.78	13.74	13.69	13.83	13.97	13.55	13.6
13.84	13.85	13.79	13.60	13.56	13.79	13.71	13.84	13.74	13.84	14.13	13.86	13.77	13.73	13.85	14.07	13.52	13.6
14.74	14.67	14.57	14.56	14.49	14.65	14.51	14.55	14.61	14.65	14.91	14.62	14.69	14.56	14.79	14.91	14.53	14.48
16.37	16.28	16.16	17.97	18.01	18.44	18.53	19.06	20.24	20.55	20.93	20.69	21.77	21.15	23.59	24.08	25.11	25.75

Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)
12-Jun-02	17-Jul-02	09-Sep-02	23-Apr-03	07-May-03	11-Jun-03	15-Jul-03	10-Sep-03	29-Apr-04	19-Jul-04	26-Aug-04	09-Sep-04	26-May-05	12-Oct-05	14-Jun-06	04-Oct-06	09-May-07	24-Sep-07
2.33	2.30	2.40	2.78	2.85	2.55	2.71	2.53	2.84	2.61	2.25	2.40	2.79	2.71	2.78	2.23	2.76	2.78
1.96	1.99	2.12	2.35	2.44	2.21	2.39	2.25	2.36	2.22	1.89	2.18	2.40	2.29	2.33	1.83	2.35	2.12
2.49	2.57	2.69	2.83	2.93	2.70	2.90	2.79	2.74	2.66	2.34	2.64	2.73	2.73	2.57	1.79	2.74	2.63
3.18	3.22	3.31	3.47	3.56	3.28	3.44	3.27	3.25	3.15	2.78	3.14	3.20	3.27	3.07	2.86	3.47	3.40
3.08	3.07	3.15	3.43	3.49	3.15	3.27	3.08	3.23	3.08	2.67	3.05	3.18	3.24	3.07	2.75	3.55	3.43
1.79	1.88	2.02	2.03	2.13	1.91	2.10	2.05	1.96	1.91	1.56	1.95	1.86	2.03	1.72	1.56	2.07	2.14

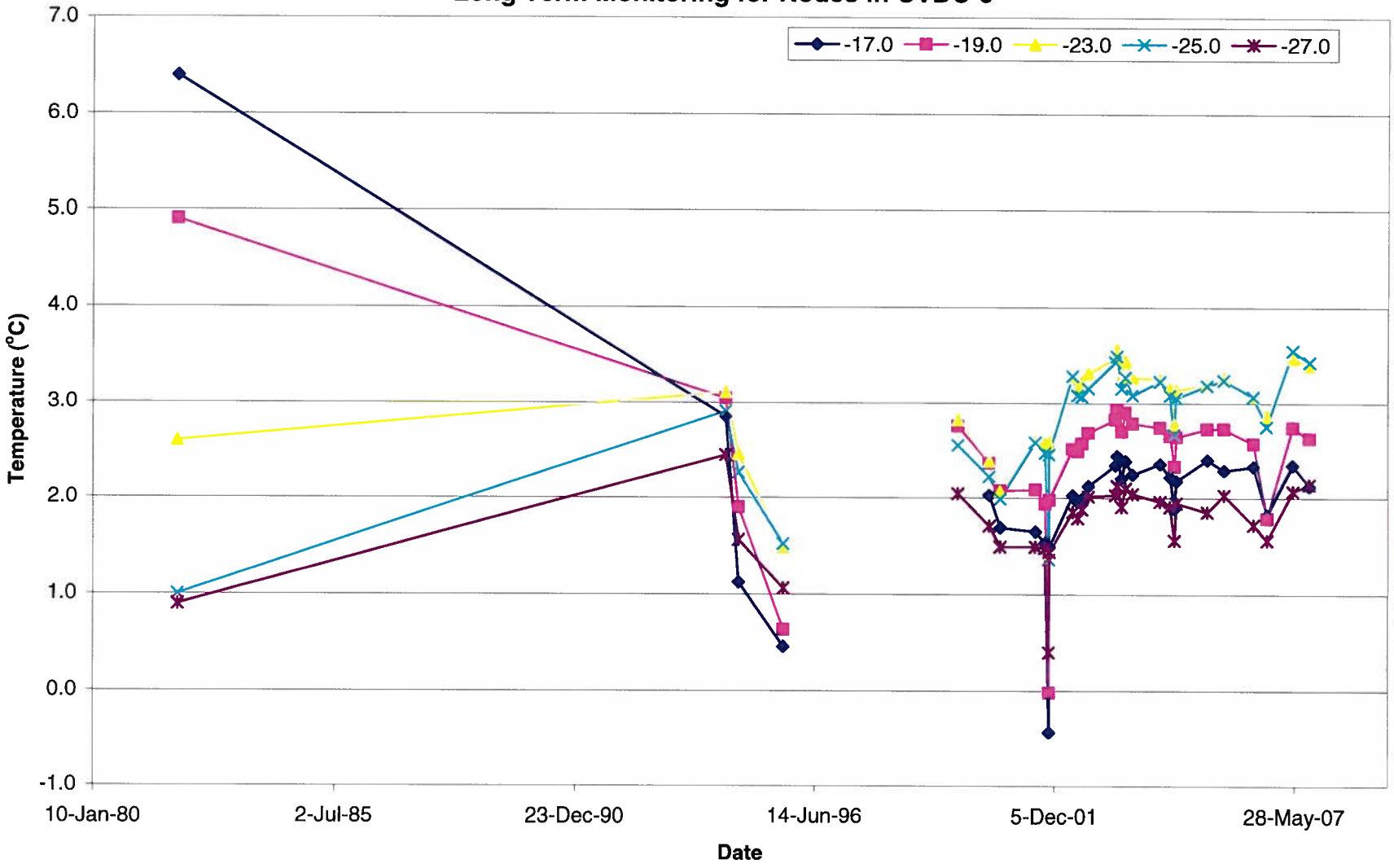
CROSS VALLEY DAM
Geothermal Monitoring
CVDC-6
(installed 1981)



Cvdtherm_2007
CVDC-6 (without error) all

BGC Engineering Inc.

Cross Valley Dam
Geothermal Monitoring
Long Term Monitoring for Nodes in CVDC-6



BH 88-4		Location:	0+450, Cross Valley Dam Crest		Elevation (m amsl):	1033.4	Coordinates:	2018.3 m N, 78.6 m W 8V580127 6914054		
		Date Installed:	1988		Thermistor Type:	Cantec Controls YSI 44007	Ice-Bath Calibration:	no	Surface Protector:	Yes
		Depth Correction:	0							

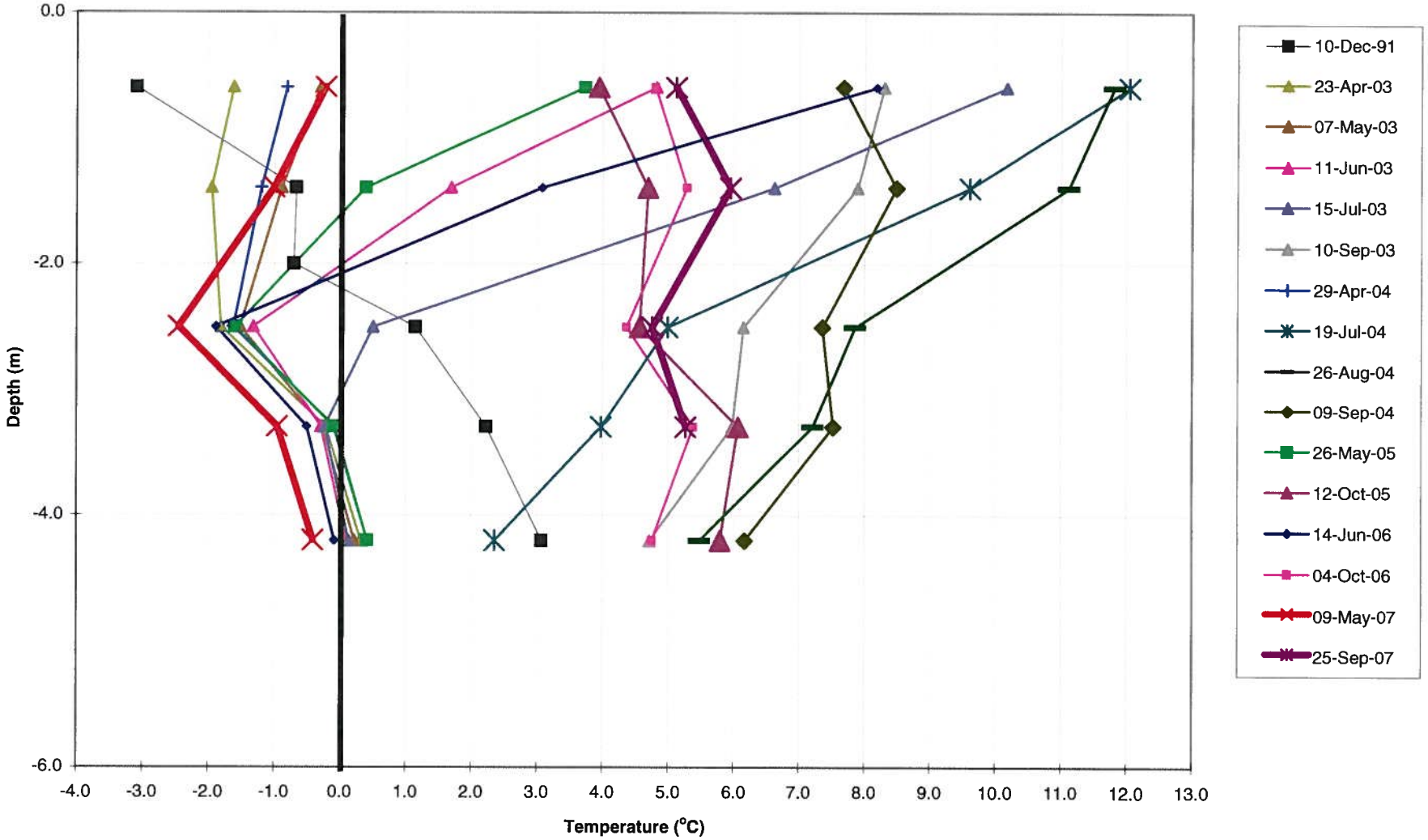
Depth on String	Actual Depth	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)
(m)	(m)	10-Dec-91	24-Jan-92	30-May-94	15-Sep-94	22-Sep-95	13-Sep-96	05-May-97	20-Nov-97	26-May-98	12-Nov-98	28-May-99	20-Sep-99	07-Jun-00	05-Sep-00
0.6	-0.6	19.03	20.60	13.87	11.01	11.17	11.28	16.59	16.64	14.19	18.18	14.78	11.07	12.95	11.74
1.4	-1.4	16.72	18.54	15.54	10.52	11.32	11.43	17.14	15.88	16.51	15.71	16.52	11.25	15.73	11.74
2.0	-2.0	16.81	17.93	18.04	11.27	12.45	13.01	19.84	17.50	19.19	17.30	19.78	13.61	19.90	14.13
2.5	-2.5	15.25	16.14	16.60	10.37	11.54	11.91	17.47	14.86	16.70	14.19	16.76	11.64	16.73	12.05
3.3	-3.3	14.45	15.36	16.31	10.79	11.91	12.48	17.17	14.25	16.40	13.47	16.53	12.09	16.51	12.59
4.2	-4.2	13.82	14.89	15.87	11.52	12.41	13.19	16.52	13.82	15.98	13.03	16.11	12.72	16.14	13.30

Depth on String	Actual Depth	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)
(m)	(m)	10-Dec-91	24-Jan-92	30-May-94	15-Sep-94	22-Sep-95	13-Sep-96	05-May-97	20-Nov-97	26-May-98	12-Nov-98	28-May-99	20-Sep-99	07-Jun-00	05-Sep-00
0.6	-0.6	-3.10	-4.61	3.10	7.77	7.47	7.27	-0.44	-0.50	2.64	-2.22	1.83	7.66	4.47	6.46
1.4	-1.4	-0.67	-2.67	0.76	8.62	7.12	6.92	-1.15	0.34	-0.42	0.55	-0.43	7.25	0.53	6.38
2.0	-2.0	-0.70	-1.96	-2.08	7.28	5.26	4.37	-3.97	-1.56	-3.34	-1.33	-3.92	3.40	-4.03	2.65
2.5	-2.5	1.15	0.03	-0.52	8.93	6.74	6.09	-1.52	1.65	-0.65	2.56	-0.72	6.55	-0.68	5.85
3.3	-3.3	2.22	1.01	-0.16	8.12	6.10	5.16	-1.19	2.48	-0.29	3.60	-0.45	5.78	-0.42	4.96
4.2	-4.2	3.07	1.86	0.33	6.74	5.23	4.00	-0.43	3.09	0.22	4.27	0.08	4.75	0.02	3.86

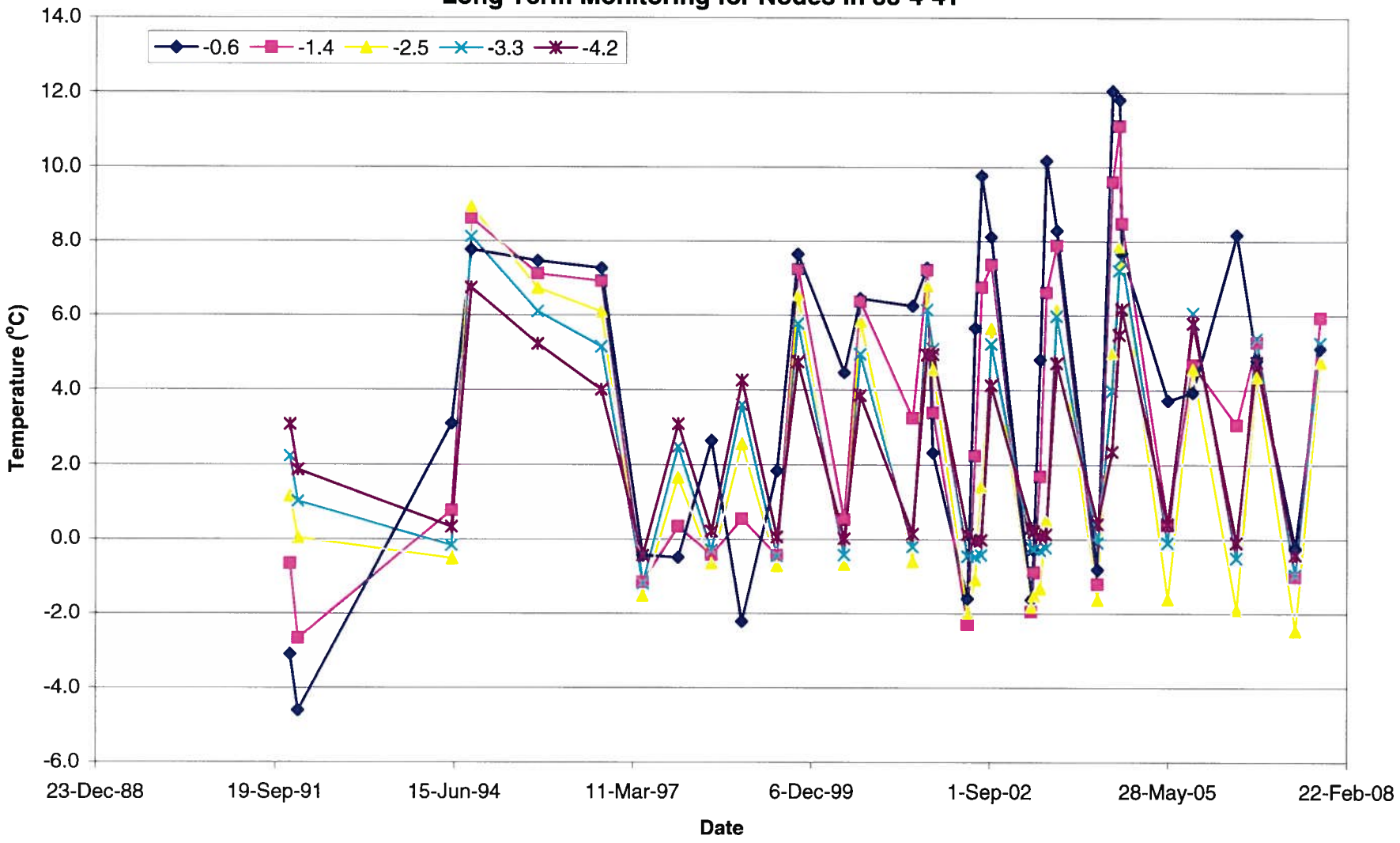
Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)	Resistivity (kOhms)
26-Jun-01	14-Sep-01	18-Oct-01	01-May-02	12-Jun-02	17-Jul-02	09-Sep-02	23-Apr-03	07-May-03	11-Jun-03	15-Jul-03	10-Sep-03	29-Apr-04	19-Jul-04	26-Aug-04	09-Sep-04	26-May-05	12-Oct-05	14-Jun-06	04-Oct-06	09-May-07	24-Sep-07
11.86	11.27	14.42	17.61	12.21	9.99	10.82	17.63	16.47	12.73	9.80	10.73	16.91	8.96	9.06	11.06	13.44	13.30	10.79	12.74	16.41	12.54
13.71	11.26	13.61	18.17	14.42	11.52	11.18	17.86	16.91	14.83	11.60	10.90	17.18	10.03	9.33	10.59	15.84	12.76	13.83	12.39	17.01	11.99
19.22	13.49	15.59	21.52	19.89	15.78	13.85	21.06	20.35	19.94	16.22	13.38	20.44	13.37	11.88	12.67	20.04	14.92	20.09	14.82	20.83	14.37
16.67	11.50	12.85	17.89	17.08	15.04	12.16	17.73	17.47	17.29	15.75	11.87	17.56	12.57	10.92	11.19	17.54	12.84	17.80	12.97	18.33	12.72
16.33	11.87	12.50	16.54	16.55	16.51	12.42	16.34	16.38	16.40	16.35	11.97	16.23	13.22	11.27	11.10	16.24	11.92	16.58	12.33	16.97	12.40
16.03	12.60	12.59	16.04	16.19	16.17	13.12	15.90	15.98	16.08	16.05	12.74	15.82	14.34	12.27	11.86	15.82	12.08	16.23	12.72	16.50	

Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)	Temperature (C)
26-Jun-01	14-Sep-01	18-Oct-01	01-May-02	12-Jun-02	17-Jul-02	09-Sep-02	23-Apr-03	07-May-03	11-Jun-03	15-Jul-03	10-Sep-03	29-Apr-04	19-Jul-04	26-Aug-04	09-Sep-04	26-May-05	12-Oct-05	14-Jun-06	04-Oct-06	09-May-07	24-Sep-07
6.25	7.29	2.32	-1.60	5.66	9.77	8.13	-1.62	-0.30	4.82	10.17	8.30	-0.81	12.04	11.81	7.68	3.73	3.94	8.18	4.80	-0.22	5.12
3.25	7.23	3.40	-2.28	2.24	6.76	7.37	-1.95	-0.89	1.69	6.62	7.89	-1.20	9.61	11.12	8.49	0.39	4.69	3.08	5.28	-1.00	5.95
-3.37	3.57	0.70	-5.52	-4.02	0.46	3.05	-5.11	-4.46	-4.07	-0.08	3.74	-4.54	3.75	6.14	4.83	-4.17	1.57	-4.21	1.70	-4.90	2.31
-0.61	6.80	4.55	-1.98	-1.08	1.41	5.66	-1.81	-1.52	-1.32	0.50	6.15	-1.62	4.99	7.86	7.36	-1.60	4.56	-1.89	4.36	-2.45	4.75
-0.21	6.15	5.11	-0.46	-0.47	-0.42	5.24	-0.22	-0.27	-0.29	-0.23	5.98	-0.09	3.98	7.21	7.52	-0.10	6.07	-0.51	5.38	-0.96	5.27
0.15	4.94	4.96	0.14	-0.04	-0.02	4.13	0.31	0.22	0.09	0.13	4.72	0.41	2.35	5.48	6.17	0.41	5.80	-0.09	4.75	-0.41	

CROSS VALLEY DAM
Geothermal Monitoring
88-4



Cross Valley Dam
Geothermal Monitoring
Long Term Monitoring for Nodes in 88-4-4T



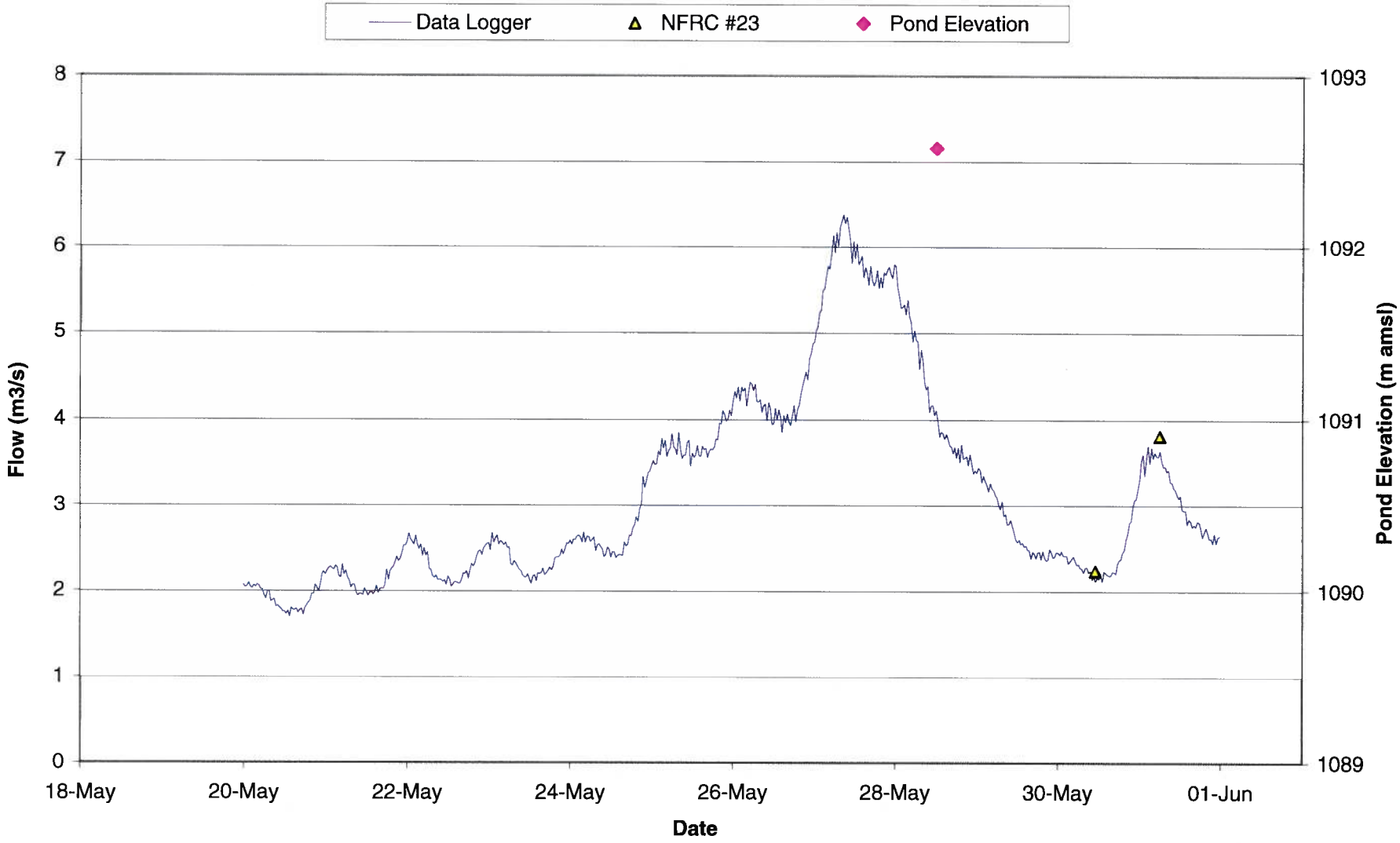
NORTH FORK ROCK DRAIN (NFRD)

POND ELEVATION AND CREEK FLOWS

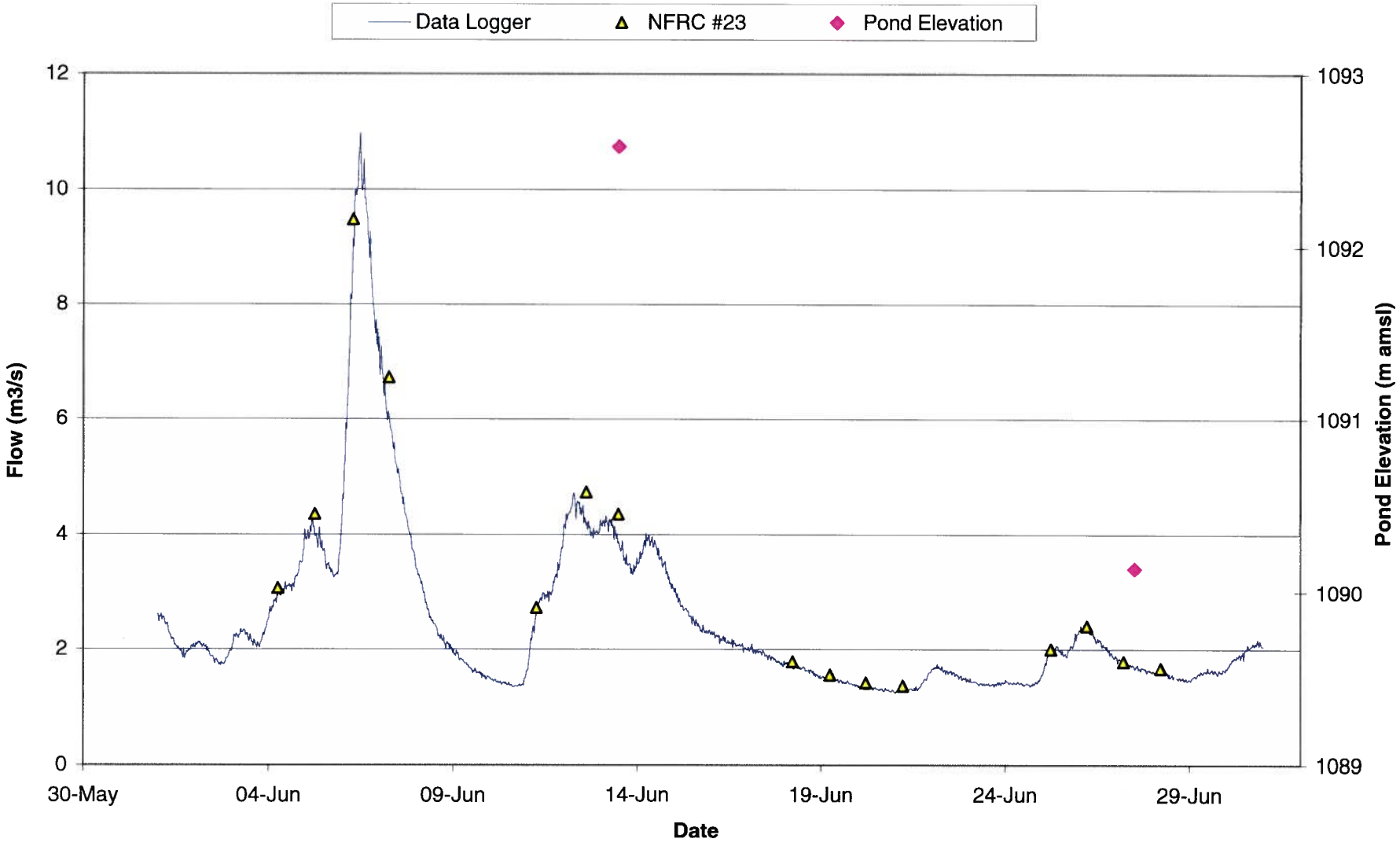
Calculations of the hydraulic gradient through the rock drain

Date	Toe Elevation (m amsl)	Pond Elevation (m amsl)	Head Difference (m)	Gradient
26-May-05	1086.84	1092.43	5.59	0.0278
28-May-05	1086.94	1092.88	5.94	0.0295
30-May-05	1086.69	1092.24	5.55	0.0276
02-Jun-05	1086.67	1091.82	5.15	0.0256
06-Jun-05	1086.46	1091.23	4.77	0.0237
09-Jun-05	1086.46	1091.09	4.62	0.0230
15-Jun-05	1086.57	1091.15	4.57	0.0227
20-Jun-05	1086.43	1090.39	3.96	0.0197
23-Jun-05	1086.30	1090.17	3.88	0.0193
21-Jul-05	1086.43	1090.38	3.95	0.0196
16-Aug-05	1086.22	1089.51	3.28	0.0163
19-Jul-06	1086.51	1090.19	3.68	0.0183
20-Jul-06	1086.43	1089.57	3.14	0.0156
07-Jun-06	1086.54	1090.58	4.04	0.0201
03-Aug-06	1086.38	1089.72	3.34	0.0166
22-Aug-05	1086.39	1089.54	3.15	0.0156
26-Aug-06	1086.36	1089.75	3.39	0.0168
28-Sep-06	1086.23	1089.31	3.08	0.0153
28-May-07	1086.88	1092.58	5.70	0.0283
13-Jun-07	1086.79	1092.04	5.25	0.0261
27-Jun-07	1086.46	1090.14	3.68	0.0183
11-Jul-07	1086.32	1089.59	3.26	0.0162
18-Jul-07	1086.44	1089.94	3.50	0.0174
01-Aug-07	1086.32	1089.49	3.17	0.0157

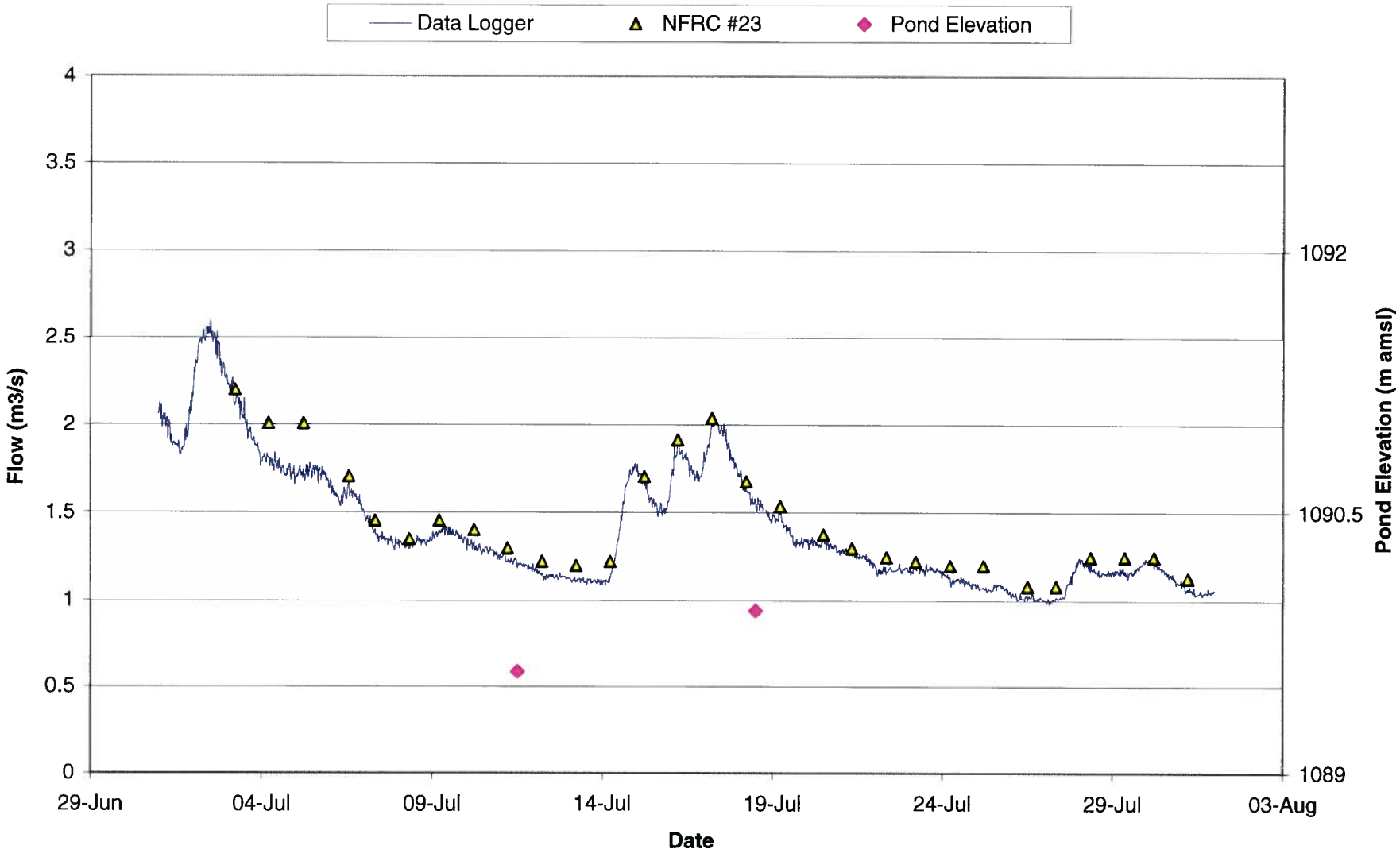
Pond Elevation and Flow downstream of NFRD - May 2007



Pond Elevation and Flow downstream of NFRD - June 2007



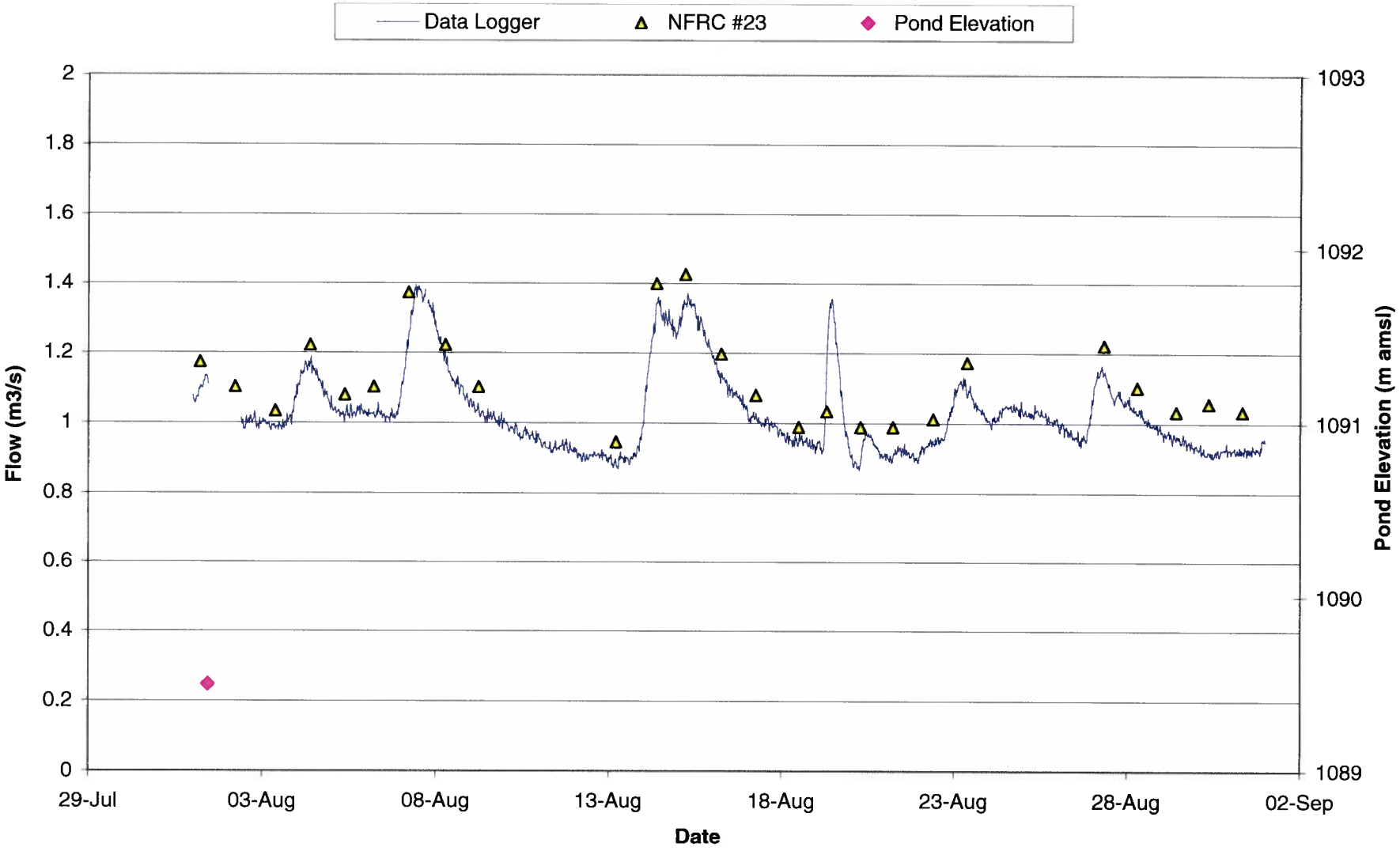
Pond Elevation and Flow downstream of NFRD - July 2007



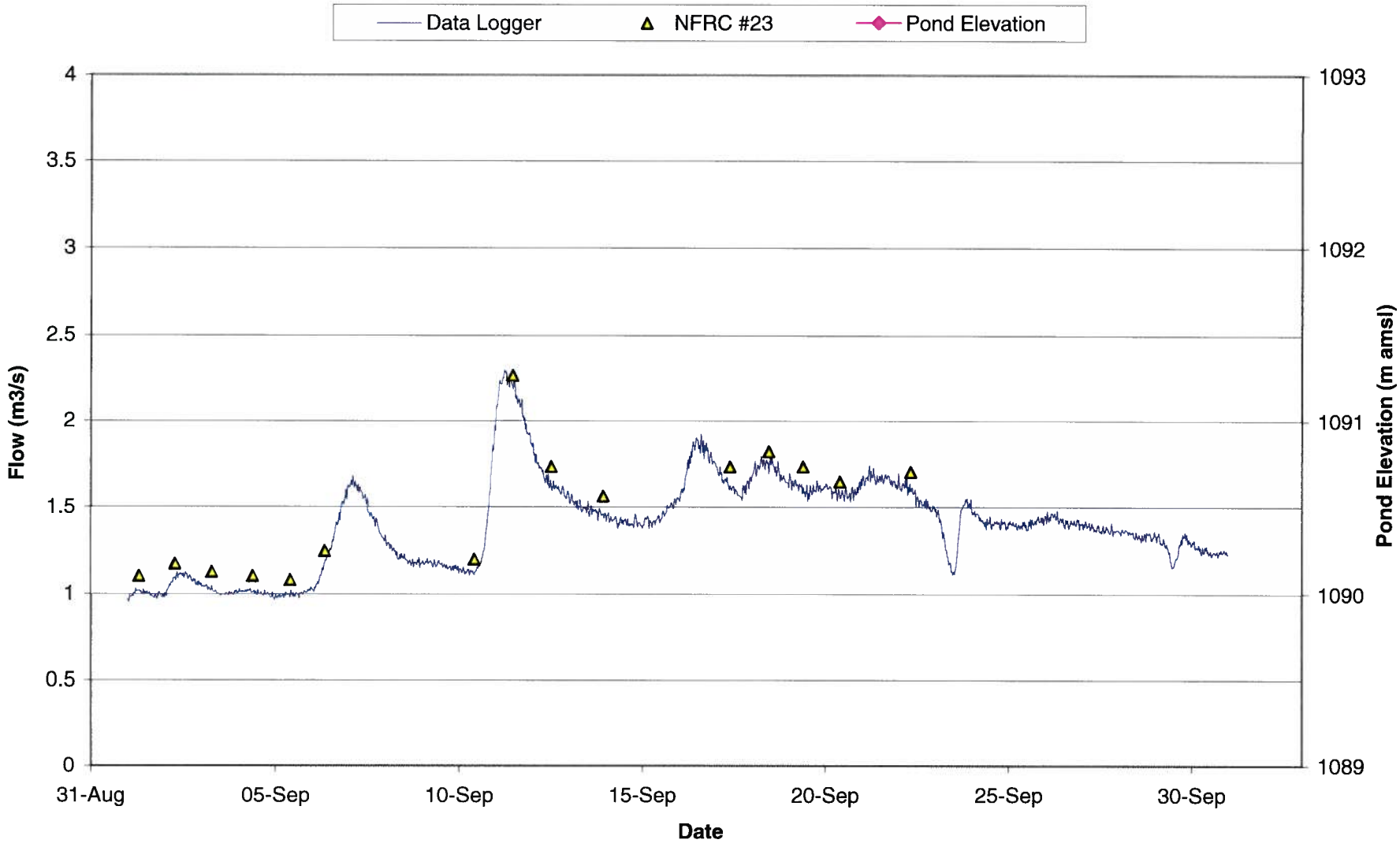
NFRD-2007
Flow-July

BGC Engineering Inc.

Pond Elevation and Flow downstream of NFRD - August 2007

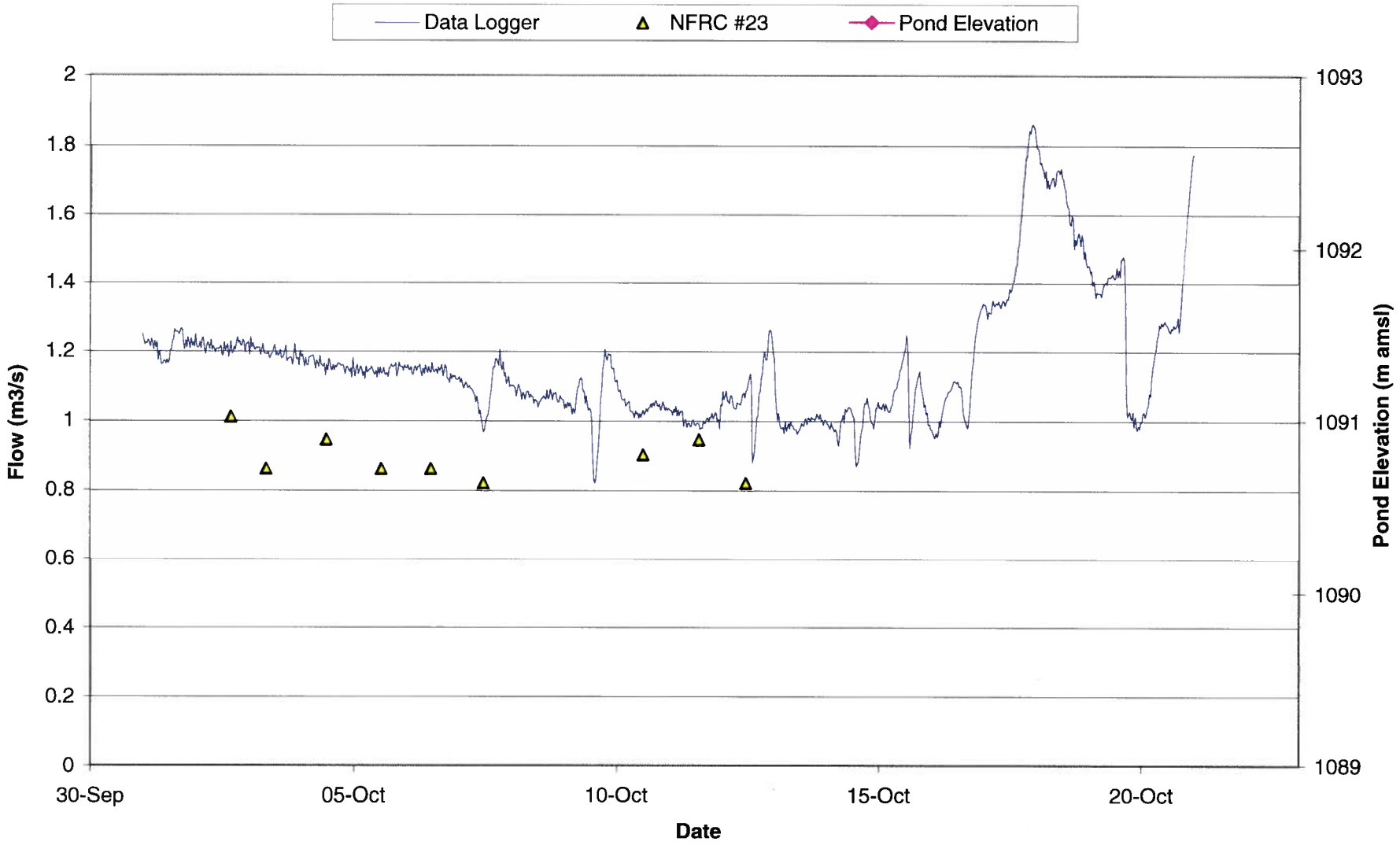


Pond Elevation and Flow downstream of NFRD - September 2007



NFRD-2007
Flow-Sep.

Pond Elevation and Flow downstream of NFRD - October 2007



FARO CREEK
DIVERSION CANAL

STAFF GAUGES

FD-1 Gauge

Date	Time (PST)	Reading (m)	Discharge (Lps)	Comment
24-May-07	19:50:00	0.480	1022	newly installed
25-May-07	09:40:00	0.412	984.0	
13-Jun-07	15:20:00	0.300	662	
26-Jun-07	15:10:00	0.215	395	
27-Jun-07	09:30:00	0.218	302.5	tail end of thundershower
11-Jul-07	13:30:00	0.175	179	
18-Jul-07	14:00:00	0.200	236	
18-Jul-07	12:40:00	0.200	249.0	
24-Jul-07		0.153	107.2	
1-Aug-07	11:50:00	0.170	198	
8-Aug-07	15:20:00	0.172	151.9	LES survey, conclude gauge zero is 97.677 (average of 4 trials)
4-Sep-07	15:40:00		155.0	
6-Sep-07		0.220	277.0	

FD-2 Gauge

Date	Time (PST)	Reading (m)	Discharge (Lps)	Comment
24-May-07	18:30:00	0.460	1133	lots of shore ice rapidly melting: gain is invalid
25-May-07	11:40:00	0.475	1069	newly installed gauge. Gain is invlaid due to heavy melting on banks
13-Jun-07	16:05:00	0.340	525	Avil Lab checked survey = OK
26-Jun-07	15:30:00	0.255	326	
27-Jun-07	12:30:00	0.247	308.3	tail end of thundershower, invalid
11-Jul-07	14:30:00	0.195	130	
18-Jul-07	14:20:00	0.210	158	
18-Jul-07	11:30:00	0.210	165.0	Good check Anvil Lab vs LES flows
24-Jul-07	17:00:00	0.185	87.9	rainfall affected
1-Aug-07	12:25:00	0.195	133	
8-Aug-07	14:40:00	0.200	106.3	
4-Sep-07	15:10:00	0.202	112.1	
6-Sep-07	PM	0.241	235.0	affected by construction

FD-1A Gauge

Date	Time (PST)	Reading (m)	Discharge (Lps)	Comment
6-Sep-07	PM	0.250	247.0	newly installed staff gauges upstream of bend

FD-1B Gauge

Date	Time (PST)	Reading (m)	Discharge (Lps)	Comment
6-Sep-07	PM	0.223	241.0	newly installed staff gauges downstream of bend

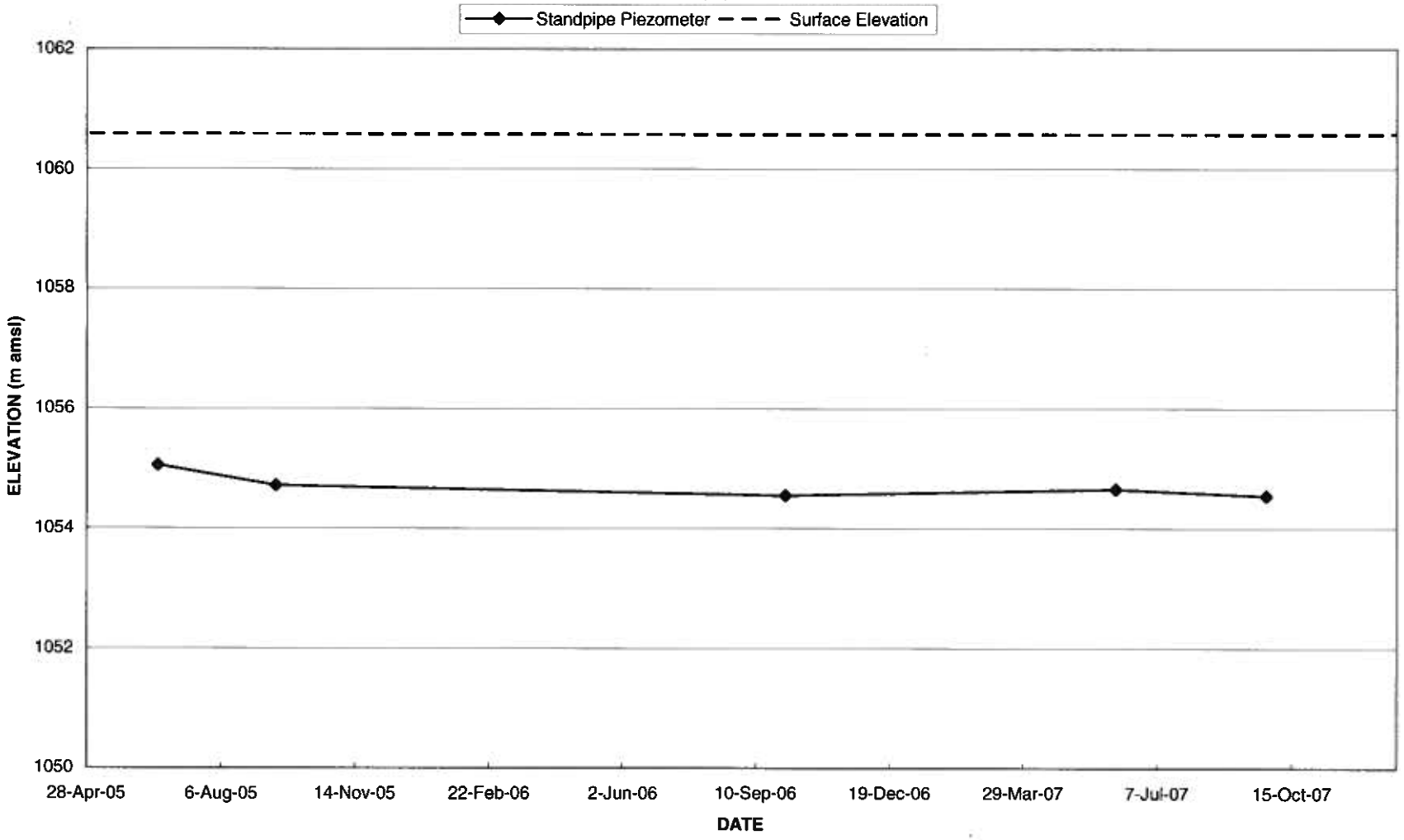
SECONDARY DAM

PIEZOMETERS

Faro Mine Instrumentation - Secondary Dam

P03-01		Location:	Secondary Impoundment Tailings	2004 Stick-Up (m):	0.53
		Coordinates:		2004 Surface Elevation (m amsl):	1060.581
Surface Protector:	?	Date Installed:	2003	Tip Elevation (m amsl):	?
				Screened Interval (m bgs):	?
Date		Water level from top of pipe (m)	Piezometric Elevation (m amsl)	Pond El. (m amsl)	Comments
20-Jun-05		6.055	1055.06		
16-Sep-05		6.395	1054.72		
02-Oct-06		6.56	1054.55		
06-Jun-07		6.455	1054.66		Gartner Lee did the wells already
26-Sep-07		6.57	1054.54		Beep

SECONDARY DAM
Piezometric Monitoring
P03-01 Standpipe Piezometer



Faro Mine Instrumentation - Secondary Dam

P03-02		Location:	Secondary Impoundment Tailings	2004 Stick-Up (m):	0.69
		Coordinates:		2004 Surface Elevation (m amsl):	1059.9
Surface Protector:	?	Date Installed:	2003	Tip Elevation (m amsl):	?
				Screened Interval (m bgs):	?
Date		Water level from top of pipe (m)	Piezometric Elevation (m amsl)	Pond El. (m amsl)	Comments
20-Jun-05		5.745	1054.85		
16-Sep-05		5.77	1054.82		
02-Oct-06		5.87	1054.72		
06-Jun-07		2.24	1058.35		No beep, bottom
26-Sep-07		5.955	1054.64		Beep

P03-03		Location:	Secondary Impoundment Tailings	2004 Stick-Up (m):	0.82
		Coordinates:		2004 Surface Elevation (m amsl):	1060.67
Surface Protector:	?	Date Installed:	2003	Tip Elevation (m amsl):	?
				Screened Interval (m bgs):	?
Date		Water level from top of pipe (m)	Piezometric Elevation (m amsl)	Pond El. (m amsl)	Comments
20-Jun-05		4.01	1057.48		
16-Sep-05		4.125	1057.37		
02-Oct-06		4.2	1057.29		
06-Jun-07		1.22	1060.27		
26-Sep-07		1.22	1060.27		No Beep - Bottom

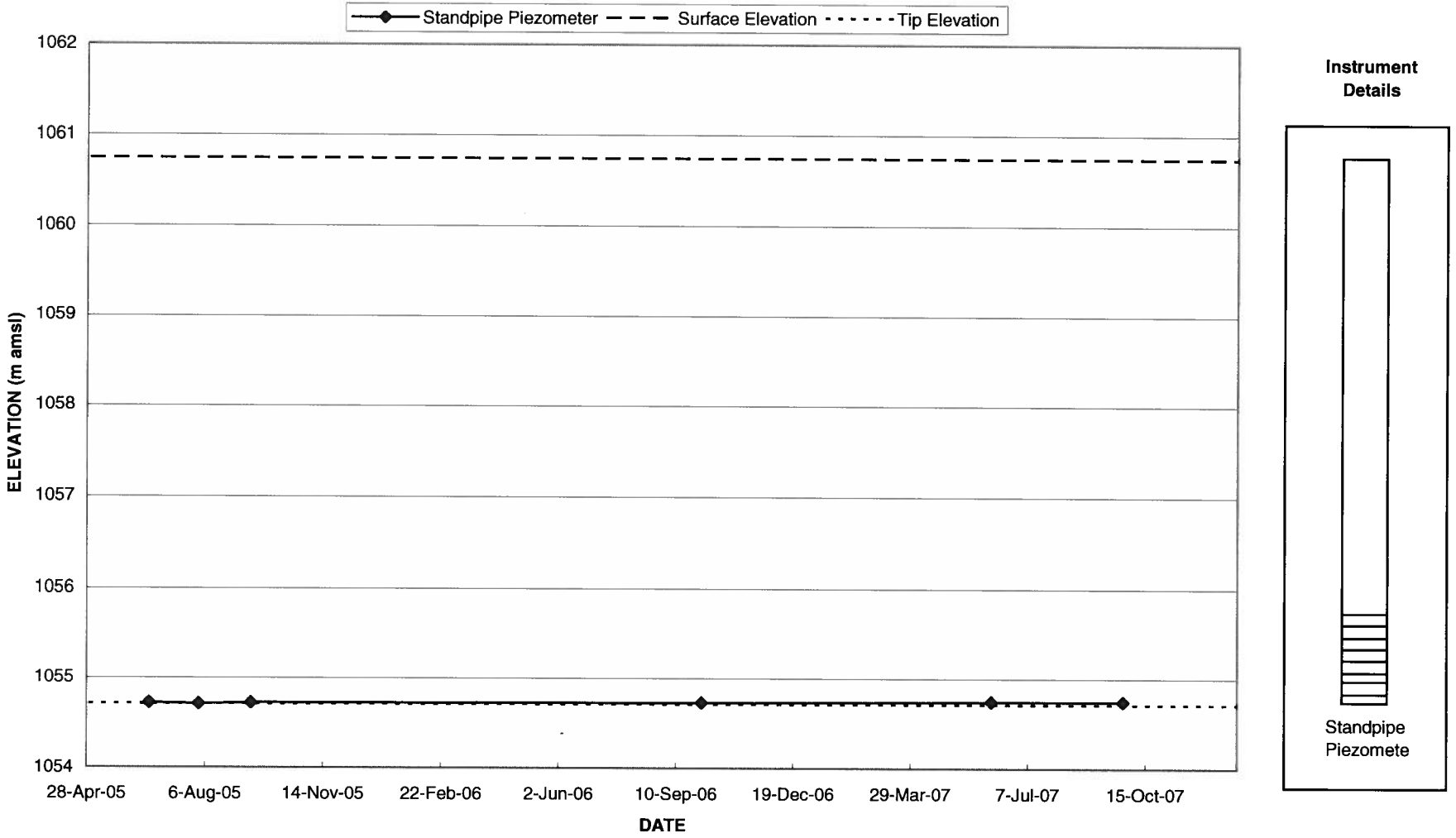
P03-04		Location:	Secondary Impoundment Tailings	2004 Stick-Up (m):	0.74
		Coordinates:		2004 Surface Elevation (m amsl):	1060.43
Surface Protector:	Yes	Date Installed:	2003	Tip Elevation (m amsl):	?
				Screened Interval (m bgs):	?
Date		Water level from top of pipe (m)	Piezometric Elevation (m amsl)	Pond El. (m amsl)	Comments
20-Jun-05		1.62	1059.55		
29-Sep-05		2.21	1058.96		
02-Oct-06		3.305	1057.87		
06-Jun-07		3.7	1057.47		no beep, bottom
26-Sep-07		3.7	1057.47		no beep, bottom

P81-06		Location:	Secondary Dam	2004 Stick-Up (m):	0.13
		Coordinates:	8V582791 6912684	2004 Surface Elevation (m amsl):	1060.74
Surface Protector:	N/A	Date Installed:	1981	Tip Elevation (m amsl):	1054.71
				Screened Interval (m bgs):	Unknown

Date		Water level from top of pipe (m)	Piezometric Elevation (m amsl)	Pond El. (m amsl)	Comments
20-Jun-05		6.81	1054.72		
1-Aug-05		6.16	1054.71		
14-Sep-05		6.81	1054.72		
02-Oct-06		6.805	1054.73		
06-Jun-07		6.79	1054.74		no beep, bottom
26-Sep-07		6.79	1054.74		no beep, bottom

Note: Water levels should be read from top of lower section of pipe (5" stick-up), not from the 26" broken piece on

SECONDARY DAM
Piezometric Monitoring
P81-06 Standpipe Piezometer

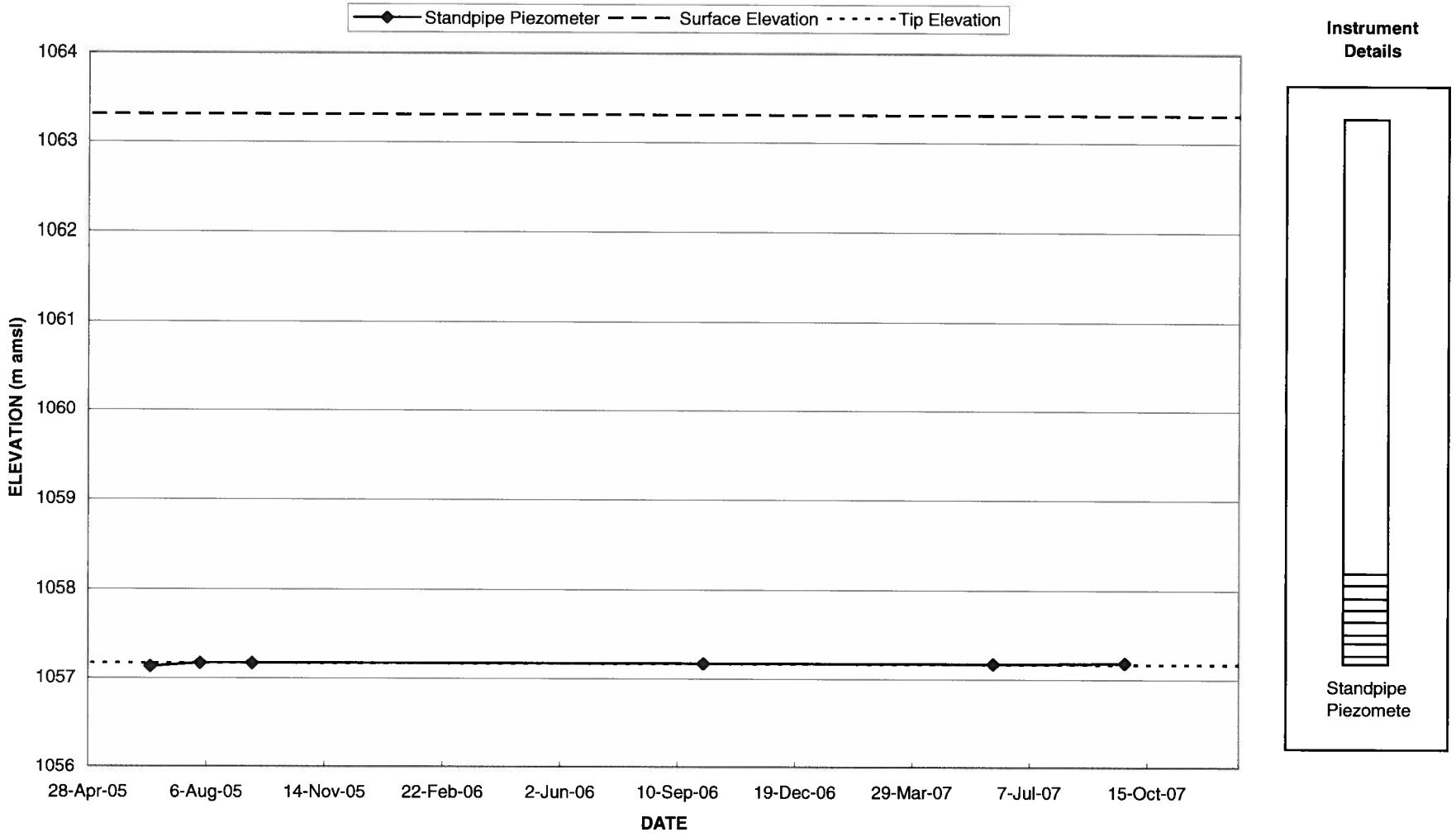


Faro Mine Instrumentation - Secondary Dam

P81-07		Location:	Secondary Dam	2004 Stick-Up (m):	0.77
		Coordinates:	8V583222 6912420	2004 Surface Elevation (m amsl):	1063.31
Surface Protector:	N/A	Date Installed:	1981	Tip Elevation (m amsl):	1057.17
				Screened Interval (m bgs):	Unknown

Date		Water level from top of pipe (m)	Piezometric Elevation (m amsl)	Pond El. (m amsl)	Comments
20-Jun-05		6.95	1057.13		
1-Aug-05		6.91	1057.17		
14-Sep-05		6.91	1057.17		
02-Oct-06		6.91	1057.17		
06-Jun-07		6.91	1057.17		
26-Sep-07		6.9	1057.18		Beep

SECONDARY DAM
Piezometric Monitoring
P81-07 Standpipe Piezometer

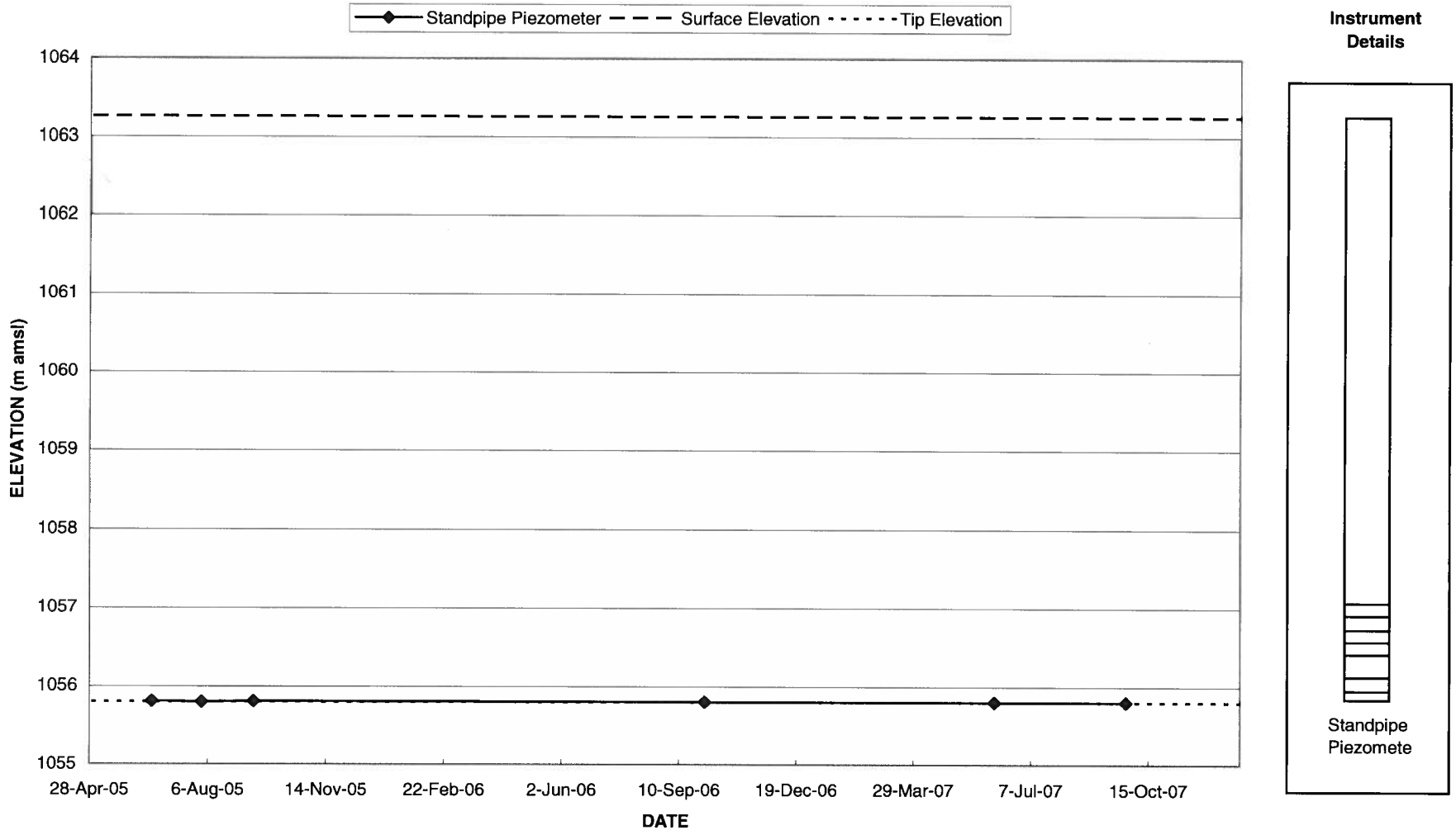


Faro Mine Instrumentation - Secondary Dam

P81-08		Location:	Secondary Dam	2004 Stick-Up (m):	0.74
		Coordinates:	8V583322 6912403	2004 Surface Elevation (m amsl):	1063.26
Surface Protector:	N/A	Date Installed:	1981	Tip Elevation (m amsl):	1055.80
				Screened Interval (m bgs):	Unknown

Date		Water level from top of pipe (m)	Piezometric Elevation (m amsl)	Pond El. (m amsl)	Comments
20-Jun-05		8.19	1055.81		
1-Aug-05		8.2	1055.80		Dry
14-Sep-05		8.19	1055.81		
02-Oct-06		8.195	1055.81		Dry
06-Jun-07		8.2	1055.80		no beep, bottom
26-Sep-07		8.2	1055.80		no beep, bottom

SECONDARY DAM
Piezometric Monitoring
P81-08 Standpipe Piezometer



Summary of 2007 Water Level Elevation for Multi_Level Wells, Faro Mine, Yukon

Well ID	DATE	Water Level Below top of Casing (m)	Elevation of Top of Casing (m)	Water Level Elevation (m)
P03-01-01	01/06/2007	5.75	1061.11	1055.36
P03-01-01	10/10/2007	5.83	1061.11	1055.28
P03-01-02	01/06/2007	5.8	1061.11	1055.31
P03-01-02	10/10/2007	5.91	1061.11	1055.20
P03-01-03	01/06/2007	5.85	1061.11	1055.26
P03-01-03	10/10/2007	5.94	1061.11	1055.17
P03-01-04	01/06/2007	5.89	1061.11	1055.22
P03-01-04	10/10/2007	5.99	1061.11	1055.12
P03-01-05	01/06/2007	5.92	1061.11	1055.19
P03-01-05	10/10/2007	6.02	1061.11	1055.09
P03-01-06	01/06/2007	5.93	1061.11	1055.18
P03-01-06	10/10/2007	6.04	1061.11	1055.07
P03-01-07	01/06/2007	5.97	1061.11	1055.14
P03-01-07	10/10/2007	6.02	1061.11	1055.09
P03-01-08	01/06/2007	5.99	1061.11	1055.12
P03-01-08	10/10/2007	6.04	1061.11	1055.07
P03-01-09	01/06/2007	6.13	1061.11	1054.98
P03-01-09	10/10/2007	6.18	1061.11	1054.93
P03-02-01	01/06/2007	5.87	1060.60	1054.73
P03-02-01	05/10/2007	5.98	1060.60	1054.62
P03-02-02	01/06/2007	5.87	1060.60	1054.73
P03-02-02	05/10/2007	6.01	1060.60	1054.59
P03-02-03	01/06/2007	5.92	1060.60	1054.68
P03-02-03	05/10/2007	6.02	1060.60	1054.58
P03-02-04	01/06/2007	5.94	1060.60	1054.66
P03-02-04	05/10/2007	6.06	1060.60	1054.54
P03-02-05	01/06/2007	6.05	1060.60	1054.55
P03-02-05	05/10/2007	6.13	1060.60	1054.47
P03-02-07	01/06/2007	5.88	1060.60	1054.72
P03-02-07	05/10/2007	5.82	1060.60	1054.78
P03-02-08	01/06/2007	5.87	1060.60	1054.73
P03-02-08	05/10/2007	5.79	1060.60	1054.81
P03-02-09	01/06/2007	5.89	1060.60	1054.71
P03-02-09	05/10/2007	5.77	1060.60	1054.83
P03-03-01	05/10/2007	7.44	1061.49	1054.05
P03-03-01	31/05/2007	7.055	1061.49	1054.43
P03-03-02	05/10/2007	7.49	1061.49	1054.00
P03-03-02	31/05/2007	7.114	1061.49	1054.38
P03-03-03	05/10/2007	7.52	1061.49	1053.97
P03-03-03	31/05/2007	7.146	1061.49	1054.34
P03-03-04	05/10/2007	7.56	1061.49	1053.93
P03-03-04	31/05/2007	7.18	1061.49	1054.31
P03-03-05	05/10/2007	7.59	1061.49	1053.90
P03-03-05	31/05/2007	7.197	1061.49	1054.29
P03-03-06	05/10/2007	7.58	1061.49	1053.91
P03-03-06	31/05/2007	7.216	1061.49	1054.27
P03-03-08	05/10/2007	7.67	1061.49	1053.82
P03-03-08	31/05/2007	7.32	1061.49	1054.17
P03-03-09	05/10/2007	7.53	1061.49	1053.96
P03-03-09	31/05/2007	7.258	1061.49	1054.23

APPENDIX V
FARO CREEK INSTRUMENT INSTALLATION

Memorandum

To: Gerry Ferris November 14, 2007

Cc: Deloitte, Anvil Range

From: Ken Nordin - LES

Re: Data from Recording Hydrometric Sites

The following is s brief description of the hydrometric monitoring at the Faro Creek Diversion conducted by Laberge Environmental Services (LES) for the open water season 2007. This assignment was completed for Gerry Ferris of BGC Engineering based on our proposal authorized by Deloitte in a letter of based on our proposal *Hydrometric Measurements and Associated Tasks Faro Creek 2007* attached. Two staff gauges with pressure transducers were installed on May 23/24 2007 at FD-1 and FD-2. The datalogger at FD-2 failed and was replaced on July 24, thus there is continuous coverage of both stations only for the period of July 24 to freeze up. An additional two staff gauges were installed in the Faro Creek Diversion in September as requested by Dana Hagger (FD-1A and FD-1B). Digital files containing raw data and preliminary rating curves are sent under separate cover.

FD-1 Faro Creek Diversion at upstream end
A staff gauge and PT2X pressure transducer were installed on May 23, 2007. FD-1 is located at the extreme upper end of the diversion channel.

FD-1A Faro Creek Diversion upstream of bend
A staff gauge was installed on September 6, 2007. FD-1A is located at UTM NAD 83 6915823 mN and 584894 mE.

FD-1B Faro Creek Diversion downstream of bend
A staff gauge was installed on September 6, 2007. FD-1B is located at 6915440 mN and 584940 mE.

FD-2 Faro Creek Diversion at downstream end upstream of cascade
A staff gauge and PT2X pressure transducer were installed on May 24, 2007 but was discovered to have failed due to an electrical short, so a replacement was installed on July 24.

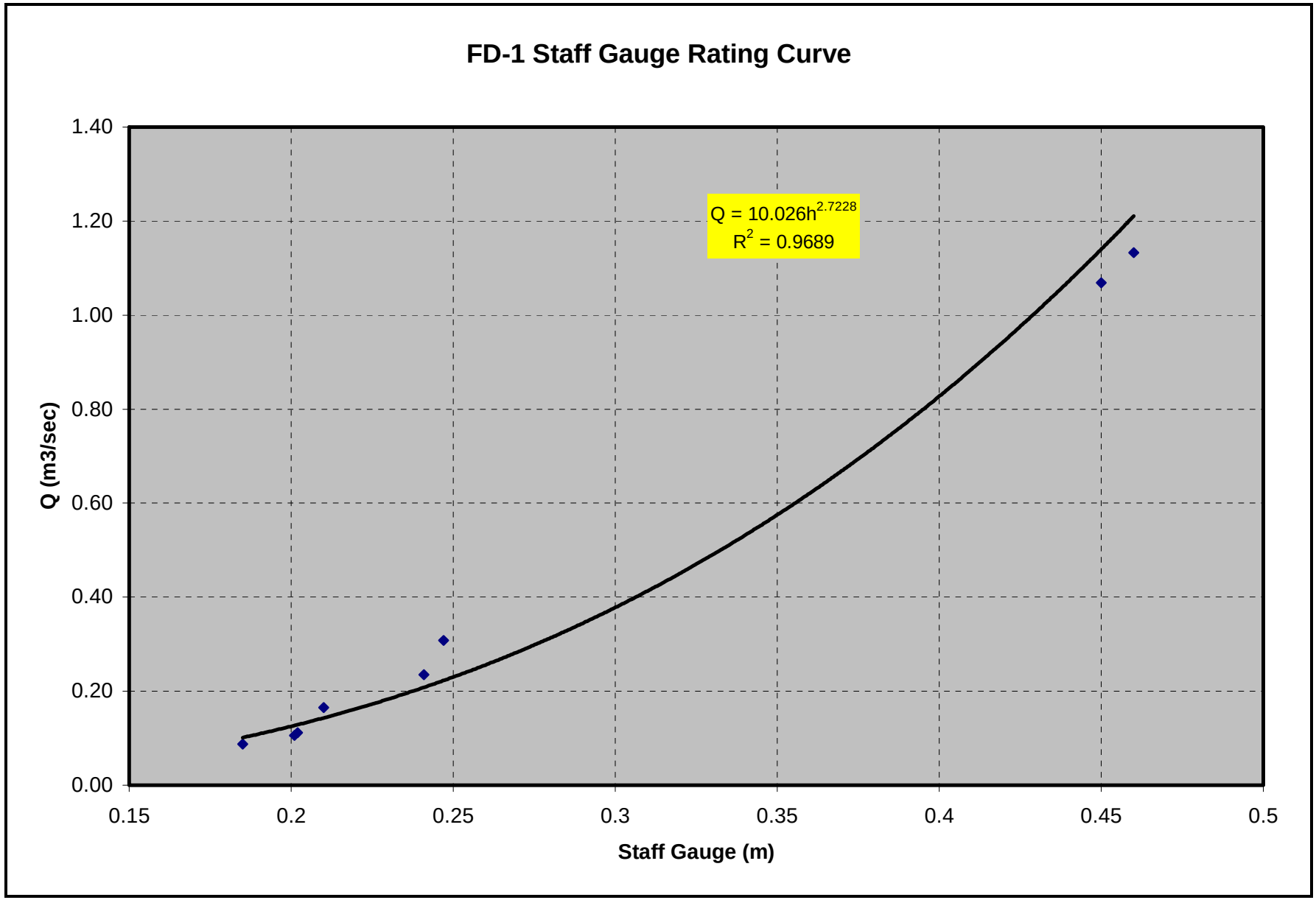
The following pages show tables and graphical summaries of the results of the project. The Rating Curves for the staff gauges should be considered preliminary until more data can be added next year.

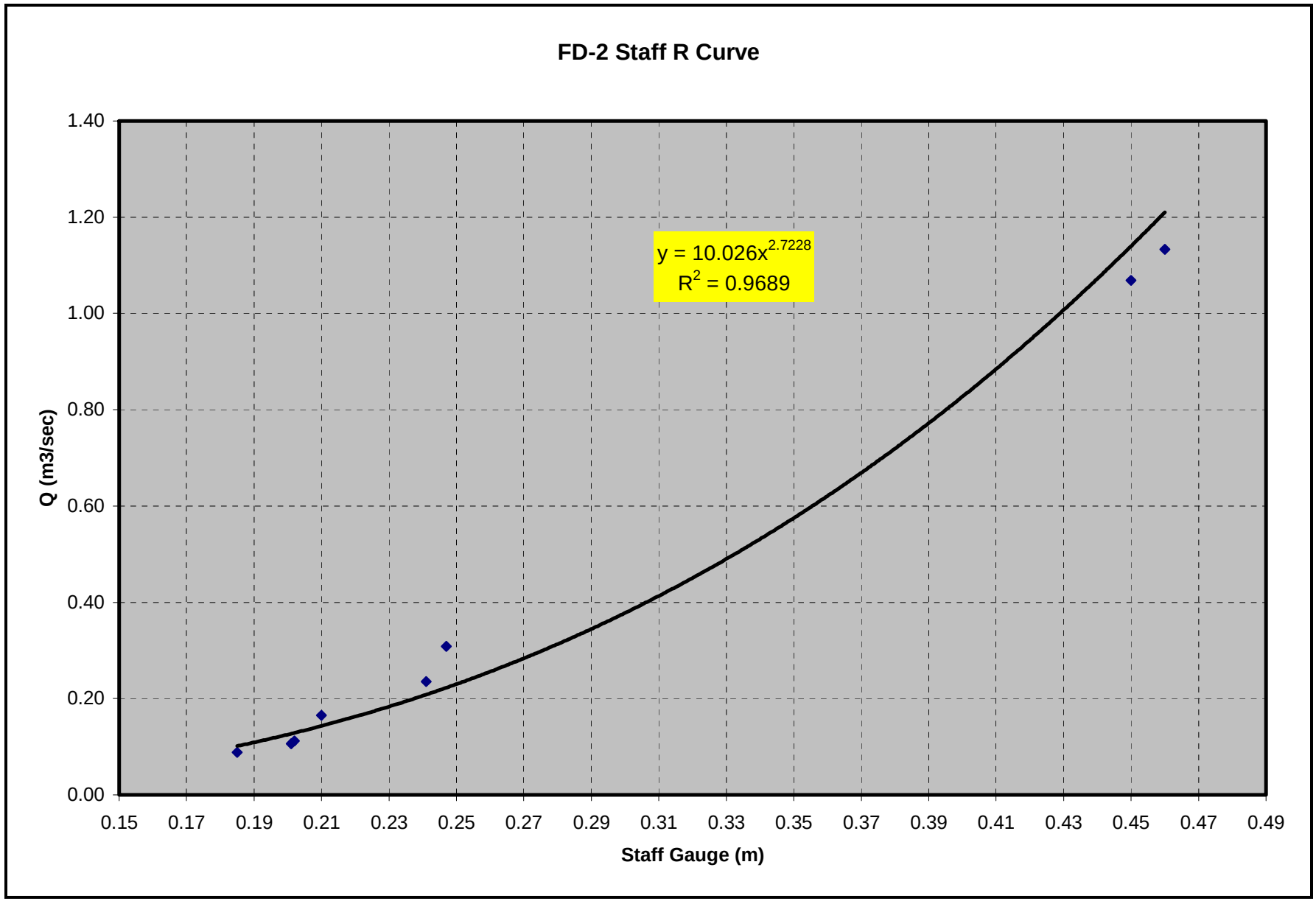
The Faro Creek diversion channel looses about 1/3 of its volume between FD-01 and FD-2 during steady state conditions. When there is high flow, heavy rain or spring runoff, losses are minimal.

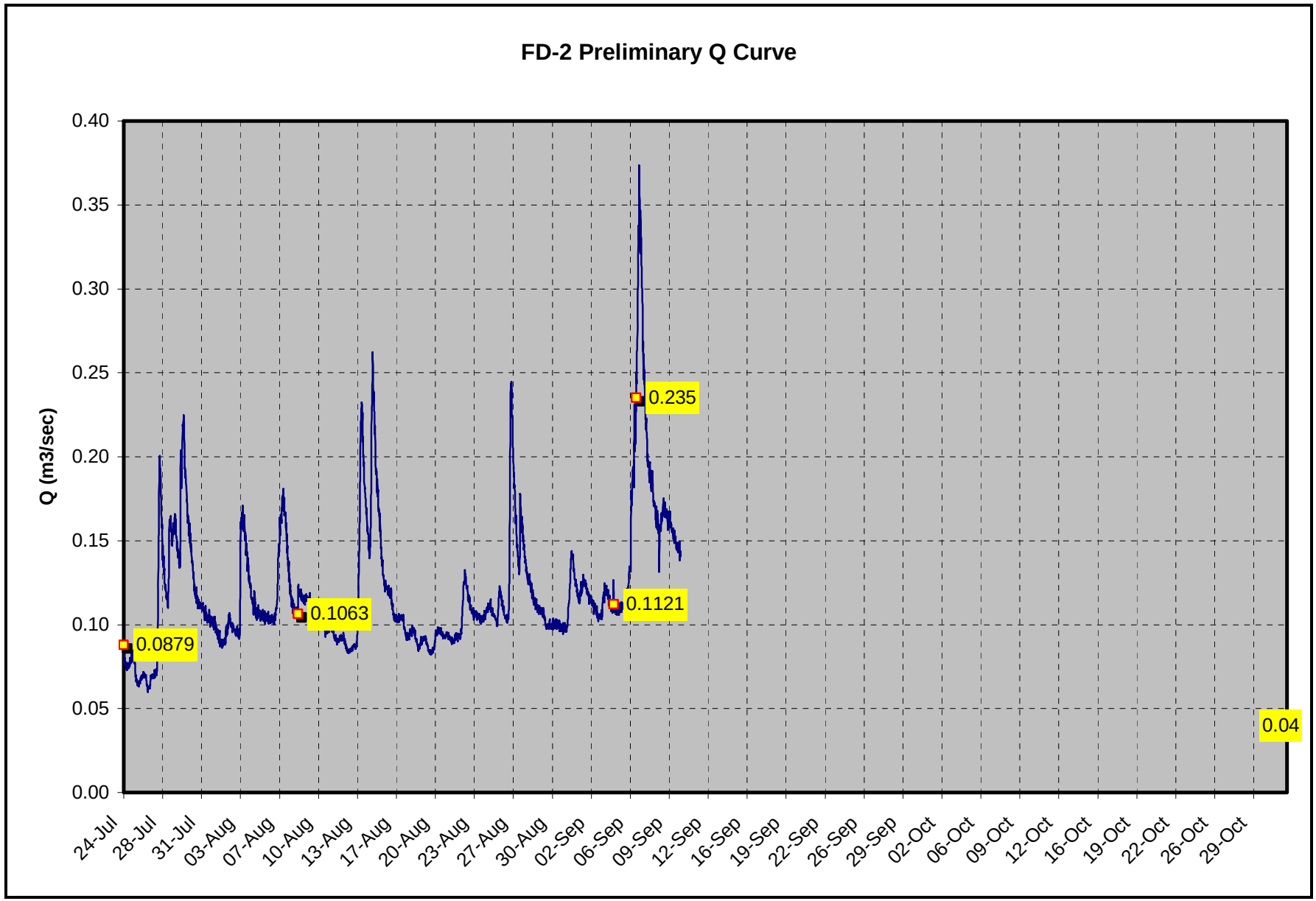
If you have any questions, contact me anytime.

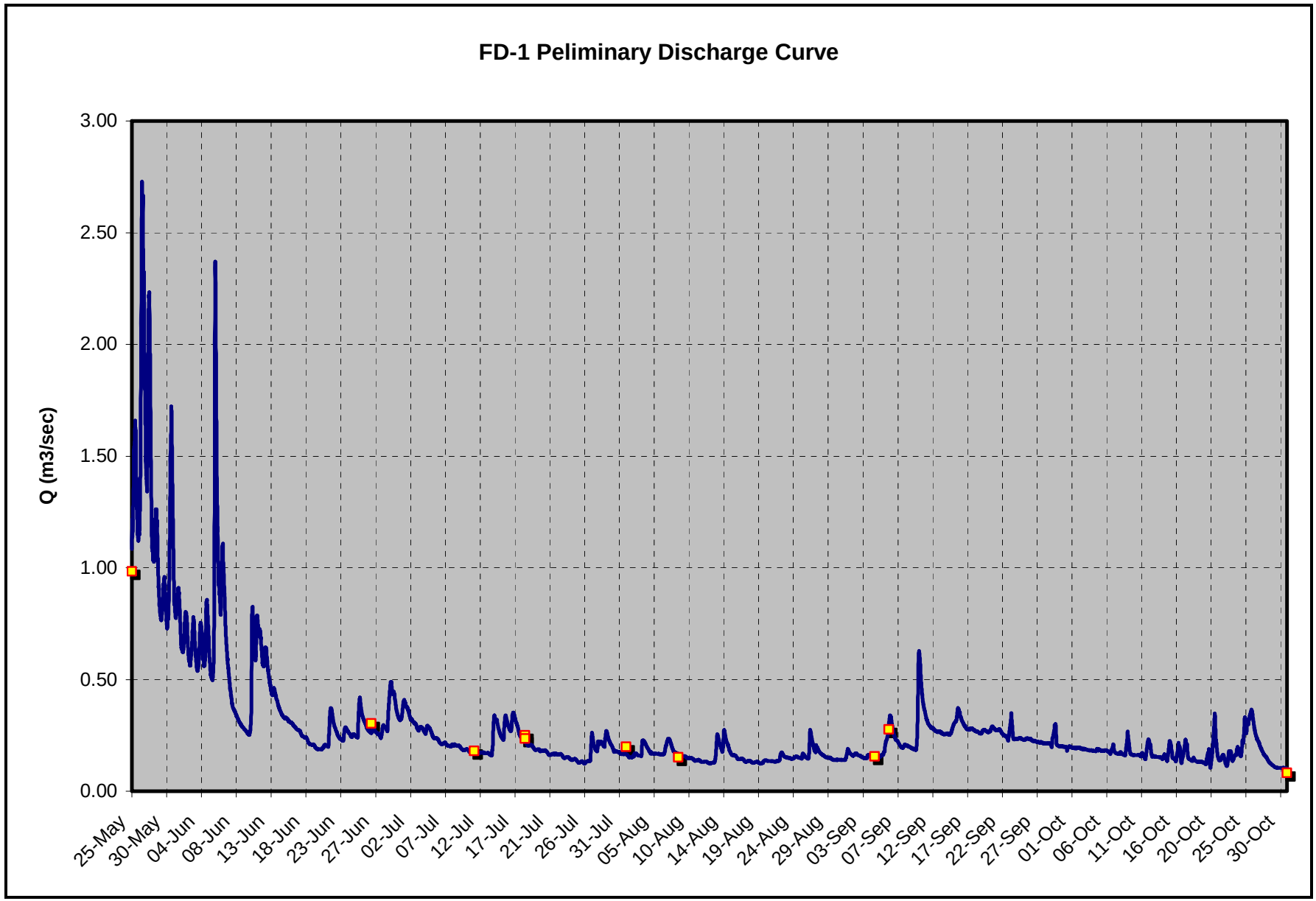
Ken Nordin AScT, CCEP
Laberge Environmental Services

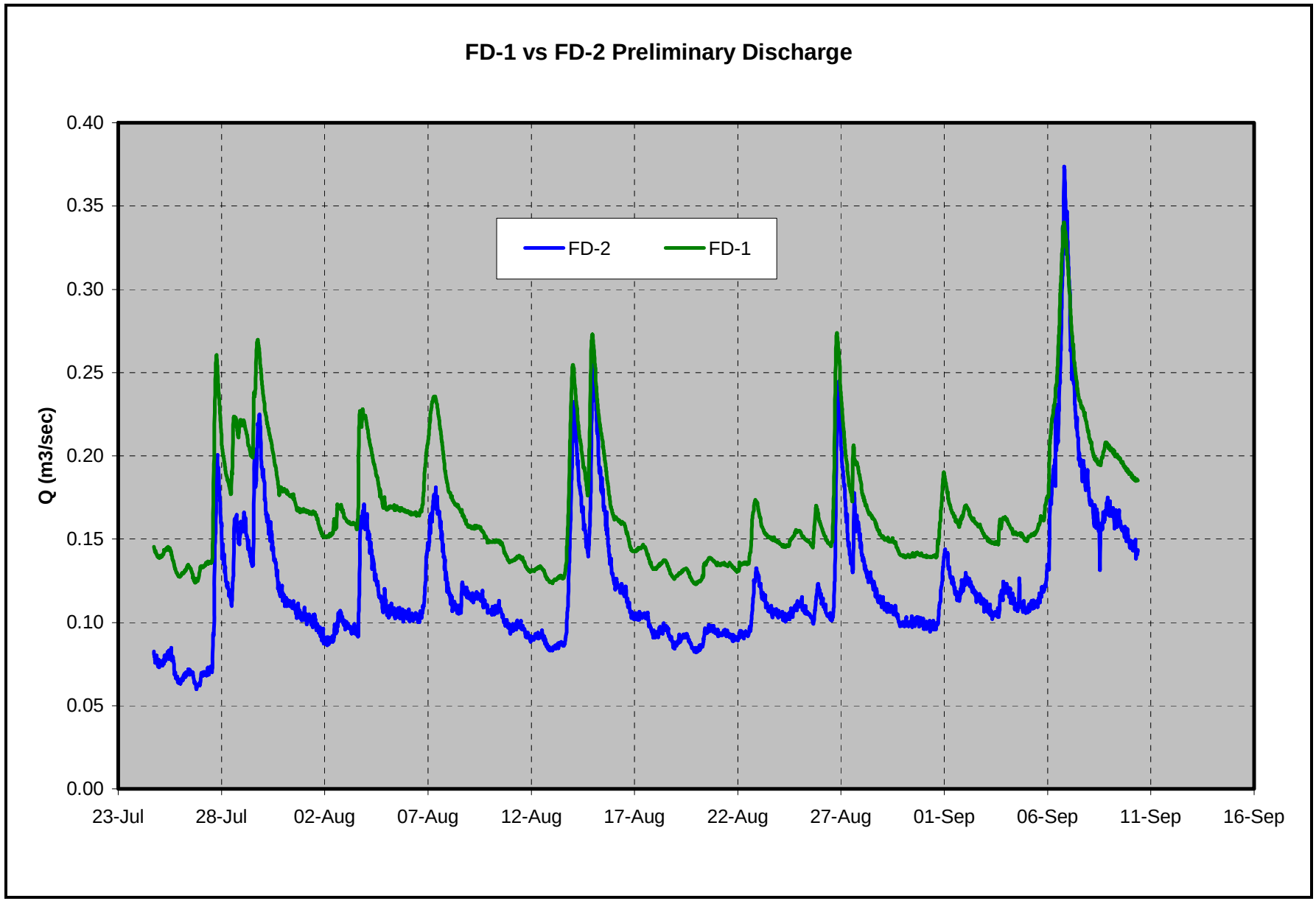
Station	Date	Time (PST)	Discharge Q L/sec	Staff Gauge height (m)	gauge zero elevation	% loss FD-1 to FD-2	Comment
FD-1	24-May-07	19:50:00	1022	0.480	97.643		newly installed
FD-1	25-May-07	09:40:00	984.0	0.412			
FD-1	13-Jun-07	15:20:00	662	0.300			
FD-1	26-Jun-07	15:10:00	395	0.215			
FD-1	27-Jun-07	09:30:00	302.5	0.218			tail end of thundershower
FD-1	11-Jul-07	13:30:00	179	0.175	97.675		
FD-1	18-Jul-07	14:00:00	236	0.200	97.68		
FD-1	18-Jul-07	12:40:00	249.0	0.200			
FD-1	24-Jul-07		107.2	0.153			
FD-1	1-Aug-07	11:50:00	198	0.170	97.681		
FD-1	8-Aug-07	15:20:00	151.9	0.172	97.673		LES survey, conclude gauge zero is 97.677 (average of 4 trials)
FD-1	4-Sep-07	15:40:00	155.0				
FD-1	6-Sep-07		277.0	0.220			
FD-1A	6-Sep-07	PM	247.0	0.250		-10.8%	newly installed staff gauges upstream and downstream of bend (FD-1A and FD-1B)
FD-1B	6-Sep-07	PM	241.0	0.223		-13%	
FD-2	24-May-07	18:30:00	1133	0.460		+9.8%	lots of shore ice rapidly melting: gain is invalid
FD-2	25-May-07	11:40:00	1069	0.475	98.775	+8%	newly installed gauge. Gain is invlaid due to heavy melting on banks
FD-2	13-Jun-07	16:05:00	525	0.340	98.774	-20.7%	Avil Lab checked survey = OK
FD-2	26-Jun-07	15:30:00	326	0.255		-17.4%	
FD-2	27-Jun-07	12:30:00	308.3	0.247		+1.9%	tail end of thundershower, invalid
FD-2	11-Jul-07	14:30:00	130	0.195		-27%	
FD-2	18-Jul-07	14:20:00	158	0.210		-33%	
FD-2	18-Jul-07	11:30:00	165.0	0.210		-33.7%	Good check Anvil Lab vs LES flows
FD-2	24-Jul-07	17:00:00	87.9	0.185		-18%	rainfall affected
FD-2	1-Aug-07	12:25:00	133	0.195		-32.8%	
FD-2	8-Aug-07	14:40:00	106.3	0.200	98.770	-30%	
FD-2	4-Sep-07	15:10:00	112.1	0.202		-27.6%	
FD-2	6-Sep-07	PM	235.0	0.241		-15.2%	affected by construction
Discharge and survey by Anvil Lab							


FD-1 Staff Gauge Rating Curve
Q = 10.026h2.7228
R2 = 0.9689
Q (m3/sec)
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
Staff Gauge (m)

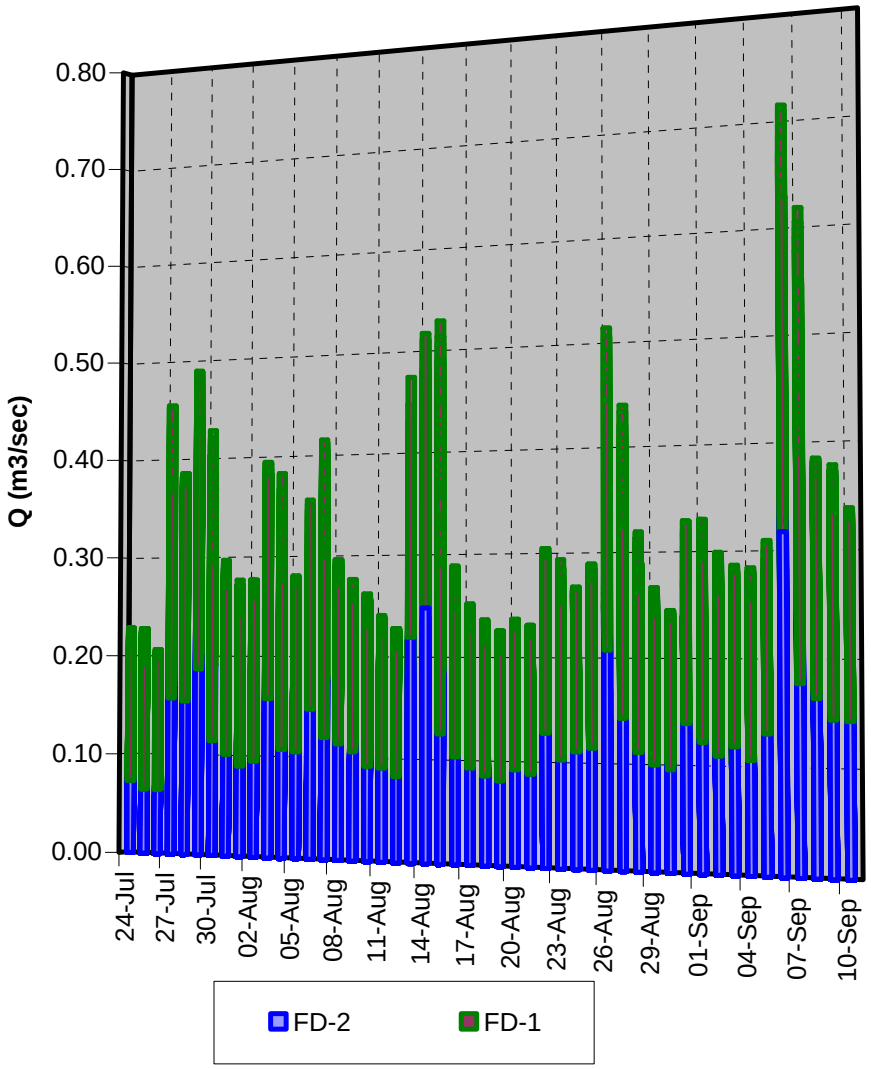

FD-2 Staff R Curve
y = 10.026x^2.7228
R^2 = 0.9689
Q (m3/sec)
Staff Gauge (m)
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
0.15
0.17
0.19
0.21
0.23
0.25
0.27
0.29
0.31
0.33
0.35
0.37
0.39
0.41
0.43
0.45
0.47
0.49


FD-2 Preliminary Q Curve
Q (m3/sec)
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.0879
0.1063
0.1121
0.235
0.04
24-Jul
28-Jul
31-Jul
03-Aug
07-Aug
10-Aug
13-Aug
17-Aug
20-Aug
23-Aug
27-Aug
30-Aug
02-Sep
06-Sep
09-Sep
12-Sep
16-Sep
19-Sep
22-Sep
26-Sep
29-Sep
02-Oct
06-Oct
09-Oct
12-Oct
16-Oct
19-Oct
22-Oct
26-Oct
29-Oct


FD-1 Peliminary Discharge Curve
Q (m3/sec)
3.00
2.50
2.00
1.50
1.00
0.50
0.00
25-May
30-May
04-Jun
08-Jun
13-Jun
18-Jun
23-Jun
27-Jun
02-Jul
07-Jul
12-Jul
17-Jul
21-Jul
26-Jul
31-Jul
05-Aug
10-Aug
14-Aug
19-Aug
24-Aug
29-Aug
03-Sep
07-Sep
12-Sep
17-Sep
22-Sep
27-Sep
01-Oct
06-Oct
11-Oct
16-Oct
20-Oct
25-Oct
30-Oct


FD-1 vs FD-2 Preliminary Discharge
Q (m3/sec)
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
FD-2
FD-1
23-Jul
28-Jul
02-Aug
07-Aug
12-Aug
17-Aug
22-Aug
27-Aug
01-Sep
06-Sep
11-Sep
16-Sep

FD-1 vs FD-2 Preliminary Discharge





FD-2 Faro Creek Diversion upstream of cascade



FD-1 Faro Creek Diversion upstream May 25 2007



FD-1 June 2007



FD-1A Sept 6 2007

Proposal

Hydrometric Measurements

and Associated Tasks

Faro Creek 2007

Submitted to:

Gerry Ferris, M.Sc., P.Eng.
Geotechnical Engineer

BGC ENGINEERING INC.

Submitted By:

Laberge
ENVIRONMENTAL SERVICES

1.0 Background

Faro Creek was diverted to allow for development of the Faro Pit in the 1960s. The creek now reports to the North Fork of Rose Creek opposite the main rock dump and just downstream of the recording gauge site R-7. BGC Engineering requires a limited hydrometric survey of the creek including two gauge sites and manual stage – discharge relationship in 2007.

2.0 Scope of Work and Methods

The two stations to be measured will one upstream near FDU – Faro Creek near the diversion point and one adjacent to the main rock dump. Each site will be provided with a stable 1m staff gauge of the Water Survey of Canada type, surveyed to an assumed datum on shore. Two PT2X data logger/sensors left over from the faro Creek Seepage study will be deployed at these sites to enhance the rating curve and document the discharge over the study period. (There will be no extra charge for deployment of these loggers as they are Deloitte equipment).
Stream discharge measurements will be made using Price type current meters with top setting wading rods. A minimum of four measurements will be made over the season and more if a crew is on site for other assignments. A preliminary rating curve will be developed for each site and a technical memo will be prepared summarizing all field data and results.
Interim results will be reported after each field visit.

The typical means of discharge measurements will be the standard velocity/area method using high quality Price Type velocity meters and self adjusting wading rods with sufficient panels to accurately represent flow distribution across the section. A typical measurement will be within plus or minus 5% of the real value, and in most cases within 1%. As part of the Quality Assurance / Quality Control (QA/QC) we will conduct a repeat velocity/area measurement at least every five measurements and report the results. Where any other method is used we will conduct and document repeat measurements. Both sites will be surveyed at least three times relative to assumed datums to keep track of staff gauge heights relative to datum.

3.0 Project Schedule and Deliverables

It is expected that this assignment will begin with the rising limb (pre freshet) monitoring and end at freeze up. We are prepared to conduct the monitoring at every opportunity while on site for other tasks. We have not included any mobilization/demobilization charges to this assignment because we will conduct the work while on site for other assignments.

The deliverables in this assignment will include all raw data and preliminary work-up generated in Excel format. A technical memo documenting and summarizing all measurements and field observations will be prepared after freeze-up. This report will be submitted to Gerry Ferris of BGC Inc. and to Deloitte Inc.

4.0 Cost Estimate

Professional Fees:

Includes all preparations, installation of gauges, field work, data management and reporting.

Total Professional Fees:	60 person hours at $72/hour	$4,320.00

Disbursements:

Mileage	no charge	$.00
Meals and Accommodation	Meals at $50/person/day x 2 people x4 days, accommodation Supplied by Deloitte	$400.00
Scientific Equipment Rental	$100/day x 4 days	$400.00
	SUBTOTAL	$5,120.00
	6% GST:	$307.20
	PROPOSED TOTAL:	**$5,427.20**

Respectfully Submitted by



Ken Nordin AScT CCEP
Laberge Environmental Services
Whitehorse Yukon