AMEC Environment & Infrastructure
a Division of AMEC Americas Limited
Suite 600 – 4445 Lougheed Highway, Burnaby, BC
Canada V5C 0E4
Tel +1 (604) 294-3811
Fax +1 (604) 294-4664
www.amec.com

Tailings Impoundment and Water Management Structures 2014 Dam Safety Inspection

Equity Silver Mine
Houston, British Columbia

FINAL REPORT

Submitted to:

Goldcorp Canada Ltd. - Equity Mine
Houston, British Columbia

Submitted by:

AMEC Environment & Infrastructure
a Division of AMEC Americas Ltd.
Burnaby, BC

October 14, 2014

AMEC File: VM00276A.4.400

EXECUTIVE SUMMARY

This report presents the results of the 2014 Dam Safety Inspection (DSI) of the Equity Silver Mine tailings management facility and water management structures.

On August 18, 2014, the Chief Inspectors office of the BC Ministry of Energy and Mines (MEM) issued orders mandating that the 2014 DSI be completed, with report submitted, by December 1, 2014. Therefore, unlike previous annual review reports, this report reflects operational aspects of the Equity Mine up to August 31, 2014.

This DSI was completed by a senior dam safety engineer who is also a registered Professional Engineer in the Province of BC. The DSI was carried out following the Canadian Dam Association (CDA) 2007 Dam Safety Guidelines, the BC Water Act Dam Safety Regulations (Reg. 163/2011), and other best practices and procedures in the industry. This report has been prepared in accordance with the requirements of the BC Ministry of Energy and Mines (MEM), including MEM's updated guidelines for Annual DSI's, revised August 2013.

a) Classification of the dam(s) in terms of Consequence of Failure (ref. Canadian Dam Association (CDA) 2007 Dam Safety Guidelines).

Classifications of the Equity Silver tailings and water management structures were completed as part of the formal Dam Safety Review (DSR) carried out for this site in September 2010 by an independent reviewer. The following table provides the updated classifications for the tailings and water management structures at Equity Silver:

Structure	Dam Classification (CDA 2007 guidelines, 5 categories)
No. 1 Seepage Pond Dam	Significant
Dam No. 1	Very High
Diversion Dam	Very High
Dam No. 2	Very High
Sludge Ponds	Low
ARD Storage Pond and South Dike	High
Splitter Dike	Significant
Dam No. 3	Significant
ARD Surge Pond Dam	Significant
Main ARD Pond Dam	Significant
No. 1 Sump Dam	Significant
Getty Creek Sump Dam	Significant
Bessemer Creek Silt Check Dam	High
Lu Lake Dam	Significant

Note: CDA 2007 Dam Safety Guidelines categories: Low, Significant, High, Very High, and Extreme.

b) Significant changes in instrumentation monitoring records.

There were no changes in instrumentation or monitoring of the tailings impoundment in 2014. Survey data for the monitoring prisms is generally consistent with past surveys. Data for the piezometers, inclinometers and survey monuments installed in the Main ARD Pond Slope continues to be consistent with expected results and historical trends recorded following stabilization measures in 2001.

c) Significant changes to dam stability and/or surface water control.

There are no such changes to report in terms of dam stability. The margin of stability (i.e. factor of safety) of the tailings dams and the water management structures remains at or above the acceptable minimum factors of safety for all sections.

Regarding surface water control, inspection of the Bessemer Creek silt check spillway remedial works indicated that the two repaired revetment blocks appeared to be in good condition with no obvious signs of deterioration or bulging at the toe.

d) For major tailings impoundments, as defined in Part 10 of the Code, a current Operation, Maintenance and Surveillance (OMS) Manual is required. The annual report shall indicate the latest revision date of the OMS Manual.

The OMS manual was produced as part of an overall site risk assessment in December 2004. The revised OMS manual was submitted to MEM in January 2005. The OMS Manual was further updated in 2006 to reflect changes in mine ownership and update parameters at the Bessemer Creek Silt Check Pond. The OMS manual was again updated in 2012 as recommended in the 2010 DSR. The next update is scheduled for Q1 2015 following completion of the dam breach and inundation studies currently underway.

e) For tailings dams classified as High or Very High Consequence, an Emergency Preparedness Plan (EPP) is required. The annual report shall indicate the latest revision date of the EPP document.

An EPP was prepared as part of an overall site risk assessment and was included in the OMS Manual submitted to MEM in January 2005. The communications directory was updated in 2006 to reflect changes in mine ownership and emergency communications. The EPP was further updated with the OMS manual in 2012 as recommended in the 2010 DSR.

On December 11, 2013 a full communications test of the EPP was performed using a mock emergency scenario involving extreme runoff and an ice-filled tailings pond spillway leading to potential release of tailings pond water to Foxy Creek. The test was well received by all stakeholders and identified a few areas for improvement to be incorporated into the next revision of the EPP and OMS Manual currently scheduled for Q1 2015 following completion of the dam breach and inundation study currently underway.

f) Scheduled date for formal Dam Safety Review (ref. Canadian Dam Association, 2007 Dam Safety Guidelines).

A formal Dam Safety Review (DSR) was carried out in September 2010, based on the CDA 2007 dam safety guidelines. The next DSR is recommended to be completed prior to the end of 2015.

g) Summary of past year's construction.

There were no significant construction activities at the tailings impoundment in 2014. Maintenance activities included removal of accumulated sediments and sloughing in water diversion ditches, repairs to ARD pipelines and general vegetation maintenance around site as recommended in the 2013 annual review.

DSI Recommendations

The following are key recommendations based on the 2014 DSI. These recommendations are also presented in Section 7.0 of this report.

- Upgrade the spillways of the Main ARD and ARD Surge Ponds to coincide with current dam safety requirements and prioritize the remaining upgrades required for the other water management structures.
- Repair the slumped area on the inside (upstream) face of the south dike forming the ARD storage pond adjacent to the "closed gate" sign and monitor regularly throughout normal pond operations for any sign of renewed slumping.
- Remove accumulated sediment from Bessemer Creek Silt Check reservoir to support risk reduction and future reclassification of the structure.
- Update the OMS Manual and associated EPP based on the results of the dam breach and inundation studies currently underway.

TABLE OF CONTENTS

Page

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

IMPORTANT NOTICE

1.0 INTRODUCTION

This report presents the results of the 2014 Dam Safety Inspection (DSI) of the tailings impoundment and water management structures at the Equity Silver Mine. This report was prepared by Mr. Andrew Witte, P.Eng based on a review of operational information provided by Equity Silver Mine personnel, as well as survey monitoring data provided by HBH Land Surveying Inc. The report is also based on the field observations made by Mr. Witte, who completed a general site inspection on September 18-19, 2014. The weather during the site visit was partly cloudy with scattered rain showers; temperatures ranged from 8 to13°C.

On August 18, 2014, the Chief Inspectors office of the BC Ministry of Energy and Mines (MEM) issued orders mandating that the 2014 DSI be completed, with report submitted, by December 1, 2014. Therefore, unlike previous annual review reports, this report reflects operational aspects of the TMF up to August 31, 2014.

This DSI was carried out following the Canadian Dam Association (CDA) 2007 Dam Safety Guidelines, as well as the requirements of British Columbia (BC) Ministry of Energy and Mines (MEM) under the *Mines Act* and Health, Safety and Reclamation Code for Mines in BC, and other best practices and procedures in the industry.

When describing the structures and sites in this report, the standard orientation convention used in dam engineering was employed where the terminology “Left” and “Right” are used while looking in the downstream direction.

The scope of this report includes the following:

- Section 2.0: a brief review of the project history and background as it relates to the DSI;
- Section 3.0: the results of the DSI regarding the tailings impoundment;
- Section 4.0: the results of the DSI regarding the water management structures;
- Section 5.0: a review of the geotechnical instrumentation and flow data used to monitor the performance of the tailings impoundment and water management structures;
- Section 6.0: a review of the status of previous recommendations; and
- Section 7.0: conclusions as to the operation of the facilities to date, along with recommendations pertaining to the 2014 DSI.

2.0 BACKGROUND AND FACILITY DESCRIPTION

The Equity Mine is located approximately 40 km south of Houston, British Columbia as shown on Figure 1. Open pit mining commenced in 1980. Open pit mining and underground mining continued until 1994, when the mine was closed. The mine is currently under care and maintenance due to well-documented long-term Acid Rock Drainage (ARD) management.

The Equity Silver tailings impoundment consists of the following main components as shown on Figure 2:

- Dam No.1
- Dam No.2
- Diversion Dam
- Bessemer Creek and Berzelius Creek diversion canals that divert surface water around the tailings impoundment

Within the ARD collection system, there are a number of water control structures. These include the following as shown on Figure 2:

- ARD Surge Pond and Dam
- Main ARD Pond and Dam
- No. 1 Dam Seepage Pond and Dam
- Getty Creek Pond and Dam
- Dam No.3
- ARD Storage Pond and South Dike
- Emergency ARD Storage Pond and Splitter Dike

The sludge settling ponds located to the north of the ARD Storage Pond and adjacent to the treatment plant have been classified as low consequence structures as per the 2007 CDA guidelines since they are completely contained by the diversion pond. As such Goldcorp manages these facilities internally as an external DSI is not required under the guidelines. Thus the sludge settling ponds are not included in the DSI documented herein.

In addition to the ARD collection system structures listed above, the Equity site also includes two freshwater management structures located outside of the ARD collection system and main mine footprint as shown on Figure 1:

- Bessemer Creek Silt Check Pond and Dam
- Lu Lake and Dams

The Equity Silver Mine was owned by Placer Dome Ltd. until 2006. On May 12, 2006, Equity Silver was acquired and is now solely owned by Goldcorp Canada Ltd.

Following the high flow events of 2002, Equity conducted an overall review of the water management system at the mine leading to an upgrade of the system in 2002 and 2003. These improvements included increasing the capacity of the ARD storage pond and Diversion Pond, construction of a new pumphouse and pipelines at the Main ARD Pond, and construction of a new HDS water treatment plant. These upgrades were the first step in a risk mitigation plan for the site water management system and are described in AMEC (2003b). An updated operating plan establishing inspection, monitoring and reporting requirements for all the dams and water management structures on the site was completed and submitted to MEM in January 2005.

Additional upgrades since 2005 have included:

- Re-construction of the Bessemer Silt Check Dam spillway in July 2006. The final survey was completed in 2007 and included in the 2007 Annual Review.
- Construction of a Splitter Dyke across the Diversion Pond completed in the summer of 2008. The Dyke divides the Diversion Pond into two storage areas, one for Emergency ARD storage and the other for treated water storage.

A review of all the discharge facilities from the ARD collection ponds (ARD Surge Pond, Main ARD Pond, Getty Creek Pond, No. 1 Sump, and No.1 Seepage Collection Pond) and the Tailings Pond was originally scheduled for the second quarter of 2005. The survey required for the review was completed in 2006 and supplemented with LiDAR data flown in 2008. The review was completed in concert with the 2010 DSR utilizing the updated dam classifications as based on the 2007 CDA dam safety guidelines. A detailed discussion of the hydraulic structures review was included as an Appendix to the 2010 Annual Review report (AMEC 2011).

3.0 TAILINGS IMPOUNDMENT

3.1 General

The current configuration of the tailings impoundment is presented in Figure 2. It is enclosed by Dam No. 1 to the north, the Diversion Dam to the west, Dam No. 2 to the south and high ground to the east. The dams were constructed with low permeability glacial till zones, transition and filter zones, and supported with compacted rockfill as shown in Figure 3. The tailings dam's crests are at an elevation of 1294 m. A permanent, open channel spillway exists on the right (east) abutment of Dam No. 1, reporting to the Berzelius Creek Diversion Channel and then discharging into Foxy Creek. Non-contact water is diverted around the impoundment via the Berzelius Creek Diversion located upstream of the impoundment. A water cover is maintained over the tailings to reduce the potential for oxidation of sulphide material in the tailings and subsequent ARD production (Klohn Crippen 2003). Seepage from Dam No. 1 is collected downstream in the No. 1 Dam Seepage Pond. A detailed history of construction and design is provided in AMEC (2005a) and Klohn Crippen (2002a).

Photo 1 shows an overview of the site taken looking north across the Main Zone Pit and Tailings Pond. Photo 2 provides an aerial view of the tailings pond looking south over Dam No. 1 and the No. 1 Dam Seepage Pond. These aerial photos were taken in 2006.

3.2 Field Assessment Observations

3.2.1 Tailings Dam No. 1

Dam No. 1 is the largest of the three containment structures forming the Tailings Pond (Photos 2 through 16). Survey monuments are located on Dam No. 1 to aid in monitoring the performance of the dam during closure (Photo 16). The results from the geotechnical monitoring program are presented in Section 4.0.

From a thorough visual inspection, Dam No. 1 appeared to be in good physical condition with no visible signs of erosion, settlement or slope deformation. Photos 3, 4, and 5 show the upstream face of Dam No.1. Photos 6 and 7 show the crest of Dam No. 1. Photos 2 and 8 through 16 show the downstream face and toe of the dam including seepage conditions. The following observations were made during the field inspection:

- The four areas of erosion on the upstream face noted in the 2011 annual inspection (AMEC 2012) and repaired in that same year were observed to be performing well with no obvious signs of distress or deterioration. These areas are known for having increased wave action, due to the prevailing winds in the South-North direction, as noted in previous reports and shown in the photos. These areas have received attention in the past, and partial repairs to the riprap have been completed on an "as-needed" basis (Klohn Crippen 2002, 2003; AMEC 2004a, 2005, 2008, 2009a, 2010). Although no specific repair work is required at this time the riprap should be continually monitored each year as part of the annual review to see if/when the riprap deteriorates with repairs to be made on this basis. However, consideration should also be given to the development of a more permanent riprap repair program utilizing more durable, appropriately graded materials. This would minimize the need for ongoing repairs in the same areas that have a documented history of erosion susceptibility due to their exposure to wind and wave action.

- Sections of the dam crest were noted to be rutted from tire traffic, most likely from past maintenance activities (Photos 6 and 7). Revegetation of rutted areas has occurred however ruts are subject to further erosion, and traffic should avoid sharp turns, or work immediately following wet climatic conditions, when soft ground conditions may be encountered. Revegetation should be considered, following riprap repair campaigns, with the appropriate seed mixes.
- Sporadic instances of larger vegetation (i.e. trees or shrubs) observed in the past along the upstream face and crest of the dam have been cut back however it is recommended that all large vegetation continue to be removed as necessary to facilitate visual inspections and prevent root ingress into the dam core materials.
- Inspection of the toe of the dam revealed some limited active seepage (along the left side of the dam); in addition to some standing water at the toe (Photos 10 and 11). It is not clear what the source of the water is (e.g. runoff, or exfiltrations through the dams). However the active seeps were identified all the way to the left abutment, where the first bend of Dam No. 1 is located (Photos 12, 13 and 14). The water observed at the dam toe was clear and free of suspended solids (Photo 14) however dense vegetation made inspection or the water source and quality difficult (Photo 12). Some of the trees and shrubs along the dam toe have been cut down but not removed (Photo 13). It is recommended that the toe area be cleared of standing and cut vegetation to promote unrestricted visual inspection of active seepage conditions in future inspections. This was also noted in previous years where flowing water was observed at the lowest point of the Dam No.1 toe above the No. 1 Dam Seepage Pond (Klohn Crippen 2003; and AMEC 2005 through 2014). Seepage water reports to the No. 1 Dam Seepage Pond, from where it is pumped back to the treatment plant prior to release. Discussion of the No.1 Dam Seepage Pond pumping records is included in Section 5.2.1.

3.2.2 Diversion Dam

The Diversion Dam makes up the western boundary of the tailings impoundment (Photo 17). The Diversion Dam is the second largest of the three tailings impoundment dams. Like Dam No. 1, survey monuments are located on the Diversion Dam for monitoring purposes. The monitoring results and their interpretation are presented in Section 4.0.

The Diversion Dam appeared to be in good physical condition with no visible signs of erosion, settlement or slope deformation. The downstream slope, upstream slope and crest are shown on Photos 18, 19 and 20, respectively. The following observations were made during the field inspection:

- Limited rutting was noted along the crest. This condition should be monitored and rectified (as necessary) as part of the regular maintenance program.
- Some vegetation was noted closer to the water line however it appeared to have been sprayed with herbicide and was dying back. Any large vegetation (i.e. shrubs and small trees) should continue to be removed as necessary to facilitate visual inspections and prevent root ingress into the dam core.
- Seepage through the Diversion Dam reports to the Diversion Pond. At the time of the inspections the water level in the Diversion Pond was low but the toe of the dam was not fully visible (Photo 18). It is recommended that the rate and quality of any seepage observed continue to be monitored as part of the annual review, as well as by the site personnel.
- The riprap on the upstream slope of the crest appears to be in generally good condition with the exception of some deterioration of larger rocks (Photo 19). Although no specific repair work is required at this time the riprap should be continually monitored each year as part of the annual review to see if/when the riprap deteriorates to the point that replacement is required.

3.2.3 Dam No. 2

Dam No. 2 makes up the southern boundary of the tailings impoundment. Dam No. 2 appeared to be in good physical condition with no visible signs of erosion, settlement or slope deformation. Typical views of the downstream slopes, upstream face and crest of Dam No. 2 are shown in Photos 21, 22, 23 and 24. The following observations were made during the field inspection:

- As with the other tailings dams, regular monitoring of the condition of the upstream slope protection should continue with repairs made as required (Photo 23).
- Removal of any large vegetation (shrubs, trees) and regular maintenance, dictated by the rate of vegetation growth.
- Similar to previous inspections, ponded water was observed at the toe of Dam No. 2 (Photo 22). The pond does not appear to have changed significantly from previous inspections. There were no visible seepage points along the toe. Any seepage would collect at a low area at the downstream toe and be directed to the ARD collection system further downstream.

3.2.4 Spillway

The spillway for the tailings impoundment was constructed in 1994. It is a permanent open channel structure with invert elevation of 1292.5 m (Photos 25 and 26). A visual inspection of the spillway showed that the structure appears to be in good physical condition with no visible signs of erosion, however there is limited to no erosion protection in the spillway channel (Photo 29). Some erosion protection was installed on the banks of the spillway inlet at the water line in

2012 and 2013 (Photos 27 and 28) to protect against wave induced erosion. The erosion protection appeared to be performing well.

The spillway has not been used to date, as the excess water is currently routed through the Main Zone Pit for discharge to the environment. Decanting into the Diversion Pond or pumping to the Main Zone Pit maintains the tailings pond water level at about El. 1292.00 m in order to provide adequate flood storage volume within the impoundment as discussed in Section 3.6.

The adequacy of the spillway channel was reviewed as part of the site wide hydraulic structures review documented in the 2010 Annual Review (AMEC 2011) and found to be adequate for conveyance of the design storm event (i.e. the probable maximum flood, PMF). However replacement of the crushed culvert in the diversion channel downstream of the spillway inlet was required which was completed in 2012. The additional recommendations pertaining to placement of erosion protection on the sides of the spillway inlet (AMEC 2011, 2012, 2013) have also been completed.

The spillway inlet should be inspected regularly for signs of erosion, sedimentation or potential obstructions with debris, to avoid flow restrictions with maintenance carried out as needed.

3.2.5 Berzelius Creek Diversion Ditch

The Berzelius Creek Diversion collects water from Berzelius Creek above the Waterline Pit and diverts it north around the tailings impoundment to be discharged into Foxy Creek (Photos 30 through 38). Visual inspection of the ditch showed it to be in good general condition. Typical views of the ditch adjacent to the tailings pond are shown in Photos 33 and 34.

It was noted in the 2008 and 2009 reviews that cobbles and boulders had begun to obstruct the ditch approximately 150 m from the diversion start point (below the water tower). There was also a significant amount of sediment (gravel, cobbles and sand) deposited in the ditch upstream of the two access road crossings at that time. The ditch is cleaned out annually as required at these two areas as shown in Photos 37 and 38; this is expected to be an on-going maintenance requirement.

The area of noticeable slope movement and erosion about 50 m upstream of the junction with the spillway inlet noted in 2011 was repaired in 2012 and vegetation is beginning to establish itself on the banks of the channel (Photo 33).

The adequacy of this ditch was reviewed as part of the site wide hydraulic structures review documented in the 2010 Annual Review (AMEC 2011) and found to be adequate for conveyance of the design storm event (i.e. 24-hour duration, 1 in 200 year return period) however replacement of the crushed culvert downstream of the spillway inlet was required. The culvert crossing was subsequently replaced in 2012 with two 1 m diameter corrugated steel pipe culverts (Photos 31 and 32). The two culverts appear to be performing satisfactorily after the 2014 freshet with negligible sediment accumulation on the upstream side.

On-going monitoring of the ditch should continue with maintenance carried out as needed. Inspections should continue to be made during the spring freshet and after heavy rainfall events to ensure that the ditch has performed satisfactorily and make any repairs as required.

3.3 Climate

The total precipitation recorded at the mine site from January to the end of August 2014 was 344.6 mm, of which 151.2 mm was recorded as rainfall and 193.4 mm as snowfall. The total precipitation recorded to the end of August 2014 was slightly lower than the average annual precipitation for these months based on site precipitation records from 1985 to 2013. The total average annual precipitation for the entire calendar year is estimated at 667.8 mm. A summary of the mine site precipitation and climate records are given in Appendix B.

3.4 Tailings Elevation

Hay & Company sounded the pond in 1995 as part of a CANMET (MEND) study. At the time of the study, the maximum tailings elevation was 1291.3 m on the shallow south and west sides and the median tailings elevation was 1287.4 m (Hay & Company Consultants Inc., 1996).

3.5 Surface Water Control and Surface Erosion

The Berzelius Creek Diversion Ditch diverts water from Berzelius Creek northward around the Waterline Pit and the tailings impoundment. It discharges into Foxy Creek. With this ditch operating properly, the tailings catchment area is roughly equal to its own area.

Erosion of the till cap on the tailings dams has been controlled by seeding the cap with a grass/legume mix. The upstream slopes of the dams have been protected from wave action and precipitation erosion with rock riprap. This rock riprap is repaired on an as-needed basis based on inspections by AMEC and site personnel. The downstream rockfill shell is not susceptible to erosion.

3.6 Water Balance

Since Equity Silver ceased operations in 1994, the water balance has consisted of simple inputs and losses. Inputs consist of precipitation and catchment area runoff and losses consist of evaporation, seepage, and decanted water.

A simplified water balance is given in Appendix C based on two hydrological cases. They include prediction of water level in the fall of the following year, prior to freeze-up, for average precipitation conditions as well as for a design flood year, assuming no decanting of water will take place over the year. The predicted pond water elevation for September 2015 for average precipitation conditions is 1292.00 m, based on a starting pond level of 1291.79 m (August 29, 2014). The predicted pond water elevation for September 2015 for the design flood conditions is 1292.69 m.

The tailings pond level is monitored and recorded on a regular basis. Each year the pond level is brought down to approximately El. 1292.0 m to accommodate storage of the design flood event (El. 1292 m provides 2.0 m of freeboard). The water is decanted to the Diversion Pond or Main Zone Pit. To the end of August 2014, the volume of water decanted from the tailings pond was approximately 379,000 m^3, which is slightly lower than the average year although about 420,000 m^3 less than the peak recorded in 2007. The decant volume records, Tailings Pond levels, and Main Zone Pit levels are provided in Appendix C.

4.0 WATER MANAGEMENT STRUCTURES

4.1 General

During early mine operation, ARD was detected as leachate from the waste rock dumps. Since then, considerable effort has gone into collecting and treating ARD as well as minimizing the generation of ARD. This includes construction of an engineered cover on the waste rock dumps to limit infiltration, as well as the development of an extensive collection system downstream of the waste dumps. The ARD is collected in a system of ditches, sumps, and ponds, treated in a water treatment plant and discharged to the environment in conformance with permit requirements.

As part of the annual DSI, the water control structures that make up the ARD Management system, including the Main ARD Pond Slope, are inspected to ensure continued good performance. The following sections outline the results of the inspection.

Detailed background information for each structure is provided in AMEC (2004a).

4.2 ARD Surge Pond and Dam

The ARD Surge Pond consists of a small dam and pipeline spillway, as shown in Photos 39, 40 and 41. ARD that originates at the waste dumps and the area between the old plant site and road reports to the Surge Pond. Discharge from the pond to the Main ARD Pond is controlled through a valved low level outlet. Two 400 mm (inside diameter) HDPE pipelines were installed in 2002 as emergency decants (Photo 46). They discharge into a ditch that includes a culvert, routed back to the Main ARD pond (Photos 47, 48 and 49). The Surge Pond Dam is approximately 5 m high and constructed of compacted glacial till.

At the time of the DSI, the Surge Pond Dam appeared to be in good physical condition. No signs of seepage or structural distress were noted on the upstream or downstream slopes during the inspection. The pond level was low, allowing inspection of much of the upstream slope. The following observations were made during the field inspection:

- In 2007, a linear feature was noted on the crest, but there was no clear indication of recent movement (AMEC 2008). The linear feature was not observed in subsequent inspections and it was hypothesized that this was not an indication of instability, but was likely a result of traffic on the dam or pipeline that was moved. A similar feature was noted during the 2014 DSI (Photo 42) which again appeared to be the result of tire traffic.
- In 2011, minor erosion was noted on the upstream face at the left abutment where a pipe and ditch discharge into the pond (Photos 43 and 44). This was subsequently armoured with additional riprap materials in 2011 and appears to have stabilized. It is recommended that consideration be given to relocating this discharge point further away from the dam abutment to reduce erosion potential at the abutment contact.

- Surficial wetness and minor sloughing was noted on the downstream side of the dam at the left abutment in 2012 (Photo 45) below the collector ditch and ARD pipe. The collector ditch has been directed into the pond as previously noted however the ditch makes an abrupt 90 degree turn and is quite shallow (Photo 44). It is not clear if the source of the surficial wetness is from leakage at the abrupt bend in the ditch, the ARD pipe or from undiverted runoff from upslope. However, it is recommended that additional repairs be performed to increase the capacity of the collector ditch both upstream and downstream of the dam crest to inhibit runoff induced erosion against the dam abutment contact.
- As noted in previous inspections the ditch downstream of the decant pipes had significant vegetation overgrowth (Photo 47) and the culvert inlets to the Main ARD Pond were partially obstructed (Photos 48 and 49). The culverts should be repaired or replaced to ensure that full capacity is available during peak flow times should decanting of the ARD Surge Pond be required.

Regular monitoring of the dam should continue, including inspections for signs of erosion or structural instability as well as keeping the emergency decant pipelines free of debris. The adequacy of the emergency decant pipelines was reviewed as part of the site wide hydraulic structures review documented in the 2010 Annual Review (AMEC 2011) and found to be inadequate for an ICC of “significant”. The current available freeboard, measured as the difference of elevation between the lowest elevation of the top of the dam and spillway invert elevation, is 0.6 m based on recent survey data collected on July 4, 2013. Goldcorp is currently reviewing the risk classifications for the ARD structures prior to implementing the requisite spillway upgrades. Furthermore, dam breach analyses, including a cascade failure analysis of the three ARD Ponds, were in progress as of the writing of this report which will be used to inform the ICC rating for the structure and thus the selected spillway design criteria. It is recommended that the spillway upgrades be implemented as soon as practical to support continued dam safety.

4.3 Main ARD Pond and Dam

The Main ARD Pond (Photos 50 through 52) consists of a small earthfill dam, pipe spillway (750 mm inside diameter), a low level outlet that feeds one pump station and an inlet system that feeds a second pump station. The pond acts as the main sump for the ARD pumping system, collecting ARD from various smaller sumps, collection ditches, and the ARD Surge Pond for transfer to the ARD storage pond or treatment plants. At the time of the DSI, the pond level was fairly low (Photo 52).

The upstream and downstream slopes, and the crest of the dam appeared to be in good physical condition and no signs of structural distress were observed. No seepage was otherwise observed on the downstream slopes or around the low level outlet pumphouse. The following observations were made during the field inspection:

- Some minor surface erosion was noted on the upstream face near the center of the dam in 2012 which was promptly repaired however still slightly visible (Photo 53). Although this does not pose an immediate threat to the integrity of the dam it should continue to be monitored and repaired as necessary in order to prevent additional progressive erosion during future storm events.

- Some slumping of surface material along the north slope (back) of the impoundment was noted during the inspection (Photo 52) and was similar to that noted in previous annual reports (2008 through 2013). The slumping appears to be of a shallow nature, triggered by erosional activity at the toe of the slope. Although this is considered to be of minor impact on the overall performance of the dam, it should continue to be monitored.
- The first pipe spillway culvert was free of obstructions (Photos 54 and 55) however the inlet to the second culvert crossing is still partially obstructed (Photo 57). The outlet channel was noted to be relatively free of vegetation however some re-growth is occurring (Photo 56).
- Regular monitoring of the dam and pipe spillway should continue, including the downstream slope and the area surrounding the lower pump house (located just at the toe of the slope). The structure of the lower pump house should also be inspected for signs of potential movement or distress (cracking, etc).
- It is recommended that all large vegetation (i.e. shrubs and small trees) continue to be removed as necessary to facilitate visual inspections.

The adequacy of the pipe spillway was reviewed as part of the site wide hydraulic structures review documented in the 2010 Annual Review (AMEC 2011) and found to be inadequate for an ICC of “significant”. The current available freeboard, measured as the difference of elevation between the lowest elevation of the top of the dam and spillway invert elevation, is 0.6 m based on recent survey data collected on July 4, 2013 which indicates that the first spillway culvert slopes slightly uphill. Goldcorp is currently reviewing the risk classifications for the ARD structures prior to implementing the requisite spillway upgrades. Furthermore, dam breach analyses, including a cascade failure analysis of the three ARD Ponds, were in progress as of the writing of this report which will be used to inform the ICC rating for the structure and thus the selected spillway design criteria. It is recommended that the spillway upgrades be implemented as soon as practical to support continued dam safety.

4.4 Main ARD Pond Slope

In 2001, Equity personnel reported ground movement on the east slope above the Main ARD Pond. The details and history of the movement are outlined in Klohn Crippen (2002b) and an assessment of the long-term risk of failure for the slope is provided in AMEC (2004b). This slope is shown in Photos 59 and 60 looking across the Main ARD Pond.

The slope currently has several counterfort drains on its surface to aid in controlling runoff as well as monitoring instrumentation including survey monuments, vibrating wire piezometers, standpipe piezometers and slope inclinometers. Instrumentation is described further in Section 5.5.

In 2009, all the remaining ditches were filled with rock per original recommendations by Klohn Crippen (2002b). Unvegetated areas and areas disturbed by construction have been re-seeded and the vegetation is maintaining itself. No visual signs of slope movement or distress were noted during the DSI. The slope appeared to be relatively dry, as noted in previous inspections however some surficial seepage was noted in the central counterfort drain.

The extensometer rigged up along the slope has indicated minimal movement in the past several years. The instrument was jostled during nearby active construction in July 2009 causing a 5 cm shift in the data however the subsequent readings indicate an overall slow trend of increasing measurements at about 6 mm/year with fluctuations proportionate to changes in air temperature. However, this apparent movement is not supported by the surface survey monument or inclinometer data and may be an artifact of the growth behavior of the tree that the extensometer cable is attached to. The piezometer and inclinometer readings do not indicate any stability concerns with the slope. Instrumentation monitoring results are further described in Section 5.5.

The ground surface of the slope above SM-01 was noted to be soft and wet with small holes up to 0.8 m in depth during the 2013 DSI. Equity staff advised that some work was performed in this area during the early summer of 2013 (completed June 7, 2013) using an excavator to uncover and repair a plugged diversion culvert that runs down the slope in this area (refer to Figure 4) which likely accounts for the freshly disturbed ground and soft surface conditions. By contrast, the surface appeared to be quite dry and firmer during the 2014 DSI.

The Main ARD Pond Slope should continue to be included in the annual inspection and review of the Main ARD Pond and associated dam. At this time, the old movements noted in the slope do not appear to have affected the integrity of the dam.

4.5 No. 1 Sump

The No. 1 Sump Dam (Photos 61, 62 and 63) is a small earth structure with a small impoundment. The dam forms part of the near-by access road. An overflow emergency outlet consists of one HDPE pipe (225 mm inside diameter), located about 0.5 m below the top of the road/dam. The dam structure and associated works appeared to be in good physical condition with no major signs of structural distress. The following observations were made during the field inspection:

- The water level was high at the time of inspection which did not allow for a complete inspection of the pond boundary however no major concerns were noted (Photo 61).
- Sediment accumulation was noted at the outlet of the ARD collection ditch adjacent to the left abutment of the dam (Photo 62) similar to previous inspections. The sediment should be removed in order to maintain sufficient live storage within the pond.
- The pipe spillway and outlet were free of obstruction and the vegetation appeared to be well managed (Photo 63) however the pipe appears to be kinked midway along its length (Photo 64) and rutting was noted in the road above the pipe alignment.

The adequacy of the pipe spillway was reviewed as part of the site wide hydraulic structures review documented in the 2010 Annual Review (AMEC 2011) and found to be inadequate for an ICC of "significant". The culvert should be upgraded as recommended in AMEC 2011 in accordance with current dam safety standards.

4.6 No.1 Dam Seepage Pond Dam

The No. 1 Dam Seepage Pond Dam (Photos 65 through 70) was constructed in the early 1980's downstream of Dam No. 1 to collect seepage and runoff from the tailings impoundment; mainly from Dam No. 1. It consists of an earthfill dam, pumphouse and fuse plug (emergency spillway). The pond water level is managed via pumping; the pump house transfers ARD seepage from the No. 1 Dam Seepage Pond to the ARD Storage Pond via a pipeline. The pond collected an average of 13,450 m^3 of water per month to the end of August 2014 of which about a third or less is estimated to be seepage from the tailings facility. Records of seepage collected for treatment from 1994 to 2014 are given in Appendix C.

The dam appeared to be in good physical condition and there were no visible signs of structural distress during the site visit. The following observations were made during the field inspection:

- The shrubs and small trees encroaching on the downstream face of the dam (Photo 66) as well as on the downstream of the fuse plug channel (Photo 70) as noted in previous inspections have been cut back and are well managed.
- There is no vegetation and limited erosion protection on the upstream face of the dam (Photo 67) which should be monitored in the future for potential erosion, formation of gullies, or slumping; mainly in the area closer to the water line.
- The right abutment includes a small channel (Photo 68) that is lined with rockfill (for runoff from the eastern hillside). The 2005 inspection noted an erosion gully at the east (right) abutment of the dam caused by runoff from the eastern hillside. The mine repaired this gully by placing geotextile in it and filling it with rock to prevent further erosion in 2008. The area appeared to be in good physical condition at the time of the 2014 site inspection, with no further indication of erosion or damage to the slope or abutment. Continued monitoring of this area is recommended for future inspections.
- Artesian flow conditions were observed from standpipe piezometers / water sampling points located downstream of the dam within two precast concrete enclosures. Stagnant water was also noticed on the ground surface around this area.

The adequacy of the spillway was reviewed as part of the site wide hydraulic structures review documented in the 2010 Annual Review (AMEC 2011) and found to be inadequate for an ICC of "significant". Furthermore the erodability of the fuse plug within the spillway is uncertain and the spillway should be upgraded as recommended in AMEC 2011 in accordance with current dam safety standards.

4.7 Getty Creek Pond and Dam

The Getty Creek Pond is located southwest of the Main Waste Dump. The pond collects ARD from the area below the Main ARD Ditch. Sumps No. 5 & 7 also feed into the Getty Creek Pond. The containment facilities consist of a small earthfill dam, a siphon system, a rockfill-lined overflow emergency spillway, and a pump house (Photos 71, 72 and 73). ARD collected in this pond is pumped via two pipelines to the main ARD Collector Ditch. The dam was constructed of compacted till and rockfill. There is no visible rockfill protection on the upstream face of the dam, and the slopes were well vegetated.

The dam structure and associated works appeared to be in good physical condition with no major signs of structural distress. The following observations were made during the field inspection:

- Vegetation overgrowth noted in previous inspections (2010 and 2011) has been cut back however continued maintenance is recommended to facilitate future visual inspections and prohibit root ingress into the dam structure.
- The siphon pipe (Photos 73 and 74) was slightly flattened where it crossed the dam crest and the outlet was over grown with vegetation.
- Some minor erosion was noted at the outlet of a buried 100 mm diameter HDPE pipeline (presumably from Sump No. 5) on the upstream right abutment of the dam (Photo 75) similar to previous inspections. This area should be monitored as part of routine inspections with erosion protection measures installed as required.

It is our understanding that the rockfill spillway is not used, and that the siphon has been used if release was required (Photo 73). The adequacy of the spillway was reviewed as part of the site wide hydraulic structures review documented in the 2010 Annual Review (AMEC 2011) and found to be inadequate for an ICC of “significant”. The spillway should be upgraded as recommended in AMEC 2011 in accordance with current dam safety standards. Until such time the integrity and operation of the siphon system should be checked on a regular basis to ensure it is in good working condition considering the current inadequacy of the emergency spillway.

4.8 Dam No.3

Dam No. 3 is a compacted till and rockfill structure that originally formed the western containment of the Diversion Pond. With the completion of the Splitter Dike in 2008, Dam No. 3 now forms the western limit of the Emergency ARD storage pond. Dam No. 3 has an emergency overflow spillway with riprap protection over the dam crest near the north abutment. Dam No. 3 is shown on Photos 76 through 79.

Visual inspection of Dam No. 3 showed that it appears to be in general good physical condition. There were no signs of structural distress on the upstream or downstream slopes. The following observations were made during the field inspection:

- Vegetation overgrowth was noted along the dam; vegetation maintenance should be completed, both on the crest and along the slopes of the dam to facilitate future visual inspections.
- Ponded water downstream from the dam was noted to be low despite active discharge from the Lu Lake spillway with no sign of beaver activity (Photo 76). Based on previous reports, a beaver dam was removed in 2008 and 2011 but there has been no notable activity in 2012, 2013 or 2014. The area should continue to be inspected for beaver activity and downstream water levels kept as low as possible.
- It appears that the spillway invert elevation is fairly high compared to the crest elevation, as shown in Photo 79. It is recommended that the dam crest be re-graded to better define the spillway channel to meet current dam safety requirements and repair the spillway riprap as appropriate.

4.9 Bessemer Creek Silt Check Pond and Dam

The Bessemer Creek Silt Check Dam is the final point of compliance on Bessemer Creek downstream of the Equity Site. It consists of a dam and a spillway. The dam is the second largest structure within the water management system at approximately 8 m in height and is shown on Photos 80 though 83.

The embankment was constructed of compacted earthfill and includes an open channel spillway at the right abutment (Photo 83). A concrete sill at the crest of the spillway (Photo 84) acts as an overflow weir for water that flows during most of the year. The spillway was originally constructed in 1980 with riprap lining underlain by a sand and gravel filter. The spillway was reconstructed in 2006 with a more permanent revetment system consisting of an articulated concrete block mat (fabriform) to prevent channelization and migration of erosion into the dam. The design of the spillway upgrade was documented in AMEC (2005) and the as-built information was documented in AMEC (2007).

The spillway has performed adequately since the reconstruction in 2006. However, distress was observed during the freshet in 2011 manifested by bulging of the concrete mat near the toe of the spillway due to the loss of two revetment blocks (AMEC 2012). The spillway was subsequently remediated, for the short term, by repairing the damaged/missing blocks with concrete, punching holes in the seepage ports between blocks to increase their flow capacity and placing lock-blocks in the toe area to increase the ballasting weight of the liner and offset the uplift pressures.

At the time of the DSI the dam structure and associated reservoir appeared to be in good physical condition with no major signs of structural distress. The following observations were made during the field inspection:

- The concrete sill of the spillway appeared intact in similar condition to previous inspections (Photo 84). The two repaired revetment blocks appeared to be in good condition with no obvious signs of deterioration (Photo 86). The spillway lining should continue to be reviewed as part of the annual inspection process.

- The spillway inlet should be inspected regularly for potential obstructions with trees and deadfall / vegetation from the surrounding slopes, to avoid flow restrictions.
- Overgrown vegetation noted during previous inspections has been removed from the upstream and downstream slopes of the dam (Photos 81 and 82). However additional vegetation overgrowth was noted on the left and right abutments that should be removed.
- Significant silt accumulation was noted against the upstream face of the dam which should be monitored periodically regarding loss of pond capacity (i.e. sediment settling capacity) and removed as required. No sinkholes or signs of erosion were noted on the upstream face of the dam.

Furthermore, during the assessment of the spillway in 2011 it was identified that the current configuration of the Silt Check spillway no longer satisfies the design criteria consistent with the updated consequence rating of the dam as per the 2010 DSR; which increased the consequence rating of the structure from “low” to “high”. It was recommended that Goldcorp consider removing the dam and spillway (or at the least, substantially reduce the height) in order to reduce the risk associated with the structure (AMEC 2012). Alternatively, as the increase in consequence rating was driven by the impacts associated with release of the impounded sediments, it is recommended that Goldcorp consider performing a major sediment removal campaign. Such action could be used as a basis for justifying a lower consequence rating of “significant” for the structure in the upcoming 2015 DSR which could bring the current spillway design configuration back into compliance with IDF requirements.

4.10 ARD Storage Pond Dams

The ARD Storage Pond (Photos 87 and 88) is formed by a contour dike that includes the South Dike next to the mine access road. The pond stores ARD pumped from the Main ARD Pond and No. 1 Dam Seepage Pond before being treated through the treatment plant. The South Dike is constructed of a low permeability till zone separated from the road rockfill with a fine filter material.

At the time of the site visit the earthfill structures appeared to be in good physical condition with no major signs of structural distress. The following observations were made during the field inspection:

- In 2013, a small slump was noted on the upstream face of the South Dike adjacent to the “Closed Gate” sign (Photo 89). An area of coarse rock was also noted at the pond side edge of the access road directly opposite the slumped area (Photo 90) which is connected to a buried road drainage culvert (Photo 91). As-built documents indicate that the culvert terminates at the edge of the road within the coarse rock and does not underlay the dike fill (AMEC 2003b) however the location of the slump directly opposite the active culvert is highly coincidental. It is recommended that the slumped area be repaired with till material and ballasted with riprap at the earliest convenience and the area monitored regularly throughout normal pond operations for any sign of renewed slumping or internal erosion.

- Vegetation was noticed established along the dikes (small trees mainly), and should be removed as required.
- An overflow trench, mostly founded in bedrock, allows discharge from the ARD Storage Pond to flow into the Emergency ARD Pond, contained by the Splitter Dike which was in good physical condition at the time of the inspection (Photos 92 and 93).

4.11 Diversion Pond Splitter Dike

Upgrades to the water treatment system included the development of additional ARD storage capacity by constructing a splitter dike across the Diversion Pond, dividing the previous pond into two storage areas, one for ARD and the other for treated water. The Diversion Pond Splitter Dike was constructed to an elevation of 1277 m with a 5 m wide crest and 2.5H:1V side slopes (Photos 94 through 97). The Splitter Dike is the largest structure within the water management system: it is a homogeneous earthfill dam constructed of compacted glacial till material, with a maximum height of approximately 12 m (AMEC 2009b).

The water levels were fairly low during the DSI (Photos 94 and 95). The Splitter Dike is a relatively new structure and appeared to be in very good condition at the time of the inspection. The following observations were made during the field inspection:

- Vegetation was noted to be well established along both the crest and side slopes, but was still short; vegetation growth should be monitored and controlled as required.
- Very minor surface rilling was noted on the downstream toe of the dam. Although the erosion does not appear to be significant it should continue to be monitored and repaired as necessary.

4.12 ARD Collection Ditches

The collection ditches intercept ARD discharging from the waste rock dumps, the old plant site, and Getty hillside, and direct it to the ARD Collection Ponds (Photo 98).

The ARD collection ditches appeared to be in good physical condition at the time of the inspection. In general, some slumping of surface cover material occurs every year along various sections of the ditches and this material is periodically cleaned out (Photo 99). To date, these surface slumps have not affected the performance of the ditches and are not considered to be significant. However, monitoring should continue as part of the annual review process. To maintain continued performance and sufficient capacity, periodic inspection should continue with repairs and clean-outs being made as required.

In December 2005, an apparent slope failure on the Bessemer waste rock dump above the Surge Pond was observed by site personnel (noted in the 2006 annual review). Based on an inspection by AMEC in July 2006, it appeared that the failure was relatively shallow and limited to the surficial waste rock dump cover material slumping into the ditch at the toe. There was no evidence of tension cracking or slumping behind the backscarp that would indicate a “deeper” failure involving the actual waste rock dump slope. It was recommended to widen the diversion ditch around the slumped toe, instead of cleaning the material out, as cleaning it out would likely cause further slumping. This was completed in July 2009.

The ditch was inspected during the 2014 site inspection and it appears that the water is flowing well around the toe, with no further erosion or slumping noted in this area however the area should still be monitored by mine personnel following runoff events.

A bypass HDPE culvert is located approximately 500 m up the main ARD Collection Ditch from the Main ARD Pond. The pipe was installed to divert ARD flows around a segment of the ditch founded in more pervious sand and gravel material at the south-western corner of the waste dump. The pipe was replaced in 2012 with a new 450 mm diameter HDPE pipeline to enhance flow capacity and reduce sedimentation in the pipe (Photos 100 and 101).

The performance of the ditch should continue to be observed by site personnel throughout the freshet and during high runoff events. If further erosion in the ditch is noted, or the cover begins to slump, the geotechnical engineer should be notified for review.

4.13 Southern Tail Pit Waste Dump Slope

The Southern Tail Pit waste dump slope is located at the south side of the waste dump, near the start of the Main ARD Collection Ditch (location noted on Figure 2). This is in an area of previous movement as documented in Klohn (1984).

In 2003, Equity personnel observed what appeared to be slope failure in the same area. The failure was characterized by a “bulge” of soil that had slipped down the slope. Equity personnel were unsure when this small failure had occurred. During each annual review since 2003, this area has been inspected by AMEC personnel. The particular “bulge” area is very wet and appears to be a groundwater discharge point.

From the inspections in 2003 to 2014, the “bulge” area does not appear to have changed significantly, except for the growth of vegetation and formation of precipitate (Photo 102). However, Equity staff has noted that the location of primary seepage flow discharging to the Main ARD ditch has moved slightly to the Northeast. It is recommended that this area continue to be inspected as part of the annual review and after heavy rain events. If changes are noted on the slope, including movement, tension cracks, or increased seepage, the slope should be investigated further.

4.14 Lu Lake Dams

In September 2011, following the update of the Water Act Dam Safety Regulation (B.C. Reg. 163/2011 dated September 12, 2011) to coincide with the 2007 CDA Dam Safety Guidelines, the consequence rating of the Lu Lake dams was increased from “low” to “significant”. As Goldcorp holds water rights to Lu Lake, the Comptroller of Water Rights requested that the Lu Lake dams be inspected annually as outlined in the updated regulation for dams with a rating of significant or higher. Thus the Lu Lake dams have been included in the annual DSI of water management structures conducted by AMEC.

Lu Lake is a natural drainage, located on Crown Land to the west of Dam No. 3 on the west side of the Equity Mine Road, which forms the headwaters of Lu Creek. Lu Lake was developed by the mine in 1979 to provide fresh water make-up for the mill through the construction of two dams (North Dam and South Dam) and a spillway structure (Photos 103 through 110) to increase the lake storage capacity (Klohn Leonoff 1980).

Visual inspection of the Lu Lake dams and spillway weir structure showed that they appeared to be in general good physical condition. There were no signs of structural distress on the upstream or downstream slopes. The following observations were made during the field inspection:

- The crest of the North Dam has been recently graded to repair rutting and ponded water as noted in previous inspections. Road barriers have been installed at the entrance to the north dam crest to inhibit public vehicle access and reduce future rutting (Photo 103).
- Vegetation overgrowth (i.e. large shrubs and trees) was noted along both dams (Photos 104 and 106); vegetation maintenance should be completed, both on the crest and along the slopes of the dams to facilitate future visual inspections.
- Standing water was noted at the downstream toe of the South Dam (Photo 107). Although it is not clear if this causes any problems in terms of stability of the dam, consideration should be given to the practicality of providing positive drainage in this area to direct water away from the dam toes.

The lake water level is controlled by the elevation of the stop log weir structure (Photos 109 and 110). At the time of the site inspection Equity staff were in the process of removing the wooden weir boards for replacement. The water level was being drawn down at a rate of one board per day. New weir boards will be installed to a level sufficient to provide the requisite amount of freeboard during flood routing (weir level requirements are currently being assessed).

5.0 MONITORING

5.1 General

To monitor performance of the Equity Silver tailings facility, observations on displacements and slope movement, water quality and seepage quality are made on a regular basis. Displacements and slope movements of the tailings dams are monitored using survey control points. This monitoring data is presented in the following sections. Observations and measurement of seepage quality and quantity are recorded. Equity site personnel monitor groundwater and surface water quality; this data is reported elsewhere.

Instruments have also been installed on the Main ARD Pond Slope as part of the stabilization program. Readings from these instruments are used to monitor performance of the slope. The Main ARD Pond slope instrumentation is described in Section 5.5.

5.2 Seepage

5.2.1 Dam No. 1

The No. 1 Dam Seepage Pond located downstream of Dam No. 1 collects the seepage from the tailings impoundment and runoff from the downstream slope of the dam. Water collected in the pond is pumped back to the HDS plant for treatment.

From pump-back records kept for the No. 1 Dam Seepage Pond, approximately 108,000 m^3 (i.e. approximately 13,500 m^3/month) of collected water was pumped to the treatment plant from January to the end of August 2014. This is very close to the monthly average derived from the annual volumes recorded since the flows peaked in 1997 which corresponds to an average of 13,450 m^3 per month. Seepage rates are estimated by averaging the pump-back volumes during the rain-free winter months (December through March). Using the December to March data relies on frozen conditions so that the pumping represents only seepage. Thus the seepage volume in 2014 is estimated at 4,500 m^3/month.

Records for previous years have shown that the seepage rates have generally decreased since peaking in 1997. From 1994 to 2014, the average seepage has been approximately 5,600 m^3/month, with some years being slightly higher or lower due to varying precipitation rates and temperature variations.

The pump-back records for the No.1 Dam Seepage Pond are presented in Appendix C.

5.2.2 Diversion Dam

Seepage through the Diversion Dam enters the Diversion Pond and mixes with the water in the Diversion Pond. Seepage in the past has not adversely affected the quality of the water in the pond (Klohn Crippen 1996a). Observations of seepage flows are discussed in Section 3.2.2.

5.2.3 Dam No. 2

Seepage through Dam No. 2 collects in a low area at the downstream toe near the junction with the Diversion Dam. This low area is part of the plant site runoff collection system. Water from this low area is channelled to the ARD Collection System and eventually treated through the treatment plant.

5.3 Tailings Dam Survey Monuments

There are a total of six survey monuments located on Dam No. 1 and the Diversion Dam to monitor displacement of the crests and slopes. These monuments have generally been read on a regular basis since their installation in 1991. The survey data results are summarized in Appendix D.

5.3.1 Dam No. 1

Three survey monuments are located on Dam No. 1. They include MP-87 at the base, MP-88 at mid-slope, and MP-90 (formally MP-89) located on the crest. MP-90 replaced MP-89 in 1996 and new prisms were installed on all three monuments in August 2002.

The following table gives an overview of the cumulative displacements between 1991 and 2014.

Table 5.1: Dam No. 1 Cumulative Displacements (1991 to 2014)

Survey Monument	Cumulative Displacements (1991 to 2014)		Cumulative Displacements (1997 to 2014)	
	Horizontal (m)	Vertical (m)	Horizontal (m)	Vertical (m)
MP-87 (Base)	0.080	-0.036	0.011	-0.013
MP-88 (Mid-slope)	0.100	-0.092	0.026	-0.025
MP-90 (Crest)	0.420	-0.317	0.042	-0.078

Since 1996, displacements have greatly decreased, as shown in Table 5.1. Most of the displacement occurred prior to 1997 for MP-87 and MP-88 and prior to 1994 for the crest monument (MP-90). These trends are shown graphically on charts provided in Appendix D. Fluctuations occurring in the survey data are likely due to survey error and it can be concluded that there have been no significant changes in displacement in 2014. An overall slow trend of vertical displacement in survey monuments MP-88 (on slope, about 2 mm/yr) and MP-90 (on crest, about 4 mm/yr) has been identified since 2003; however no work is required at this time.

5.3.2 Diversion Dam

Three survey monuments are located along the El. 1292 m crest bench of the Diversion Dam. As stated in previous annual reviews, all three of the monuments were disturbed during snow clearing activities in 1996-1997 (Klohn Crippen 2003). The monuments were re-established in October 1997. The prism was replaced on MP-72 in November 2002 and the prism on MP-71 was tightened in October 2003 and again in July 2013. A new backsight location was established in July 2012 for reading all three survey monuments.

The following table gives an overview of the cumulative displacements between 1991 and 2014.

Table 5.2: Diversion Dam Cumulative Displacements (1991 to 2014)

Survey Monument	Cumulative Displacements (1991 to 2014)		Cumulative Displacements (1999 to 2014)	
	Horizontal (m)	Vertical (m)	Horizontal (m)	Vertical (m)
MP-70 (Crest)	0.688	-	0.047	-0.020
MP-71 (Crest)	0.274	-	0.036	-0.075
MP-72 (Crest)	0.412	-	0.059	-0.006

The total cumulative vertical settlement for all three monuments is taken from 1999 to 2014 only as there was a change in surveyor in 1999 and vertical readings were not consistent with the previous surveyor's readings (for the Diversion Dam only). The readings generally vary within the accuracy of the survey (approximately 9 mm to 15 mm) and it is concluded that there have been no significant displacements in the Diversion Dam. The survey error for the Diversion Dam will likely be higher than that of Dam No. 1 as the survey control point is a further horizontal distance from the Diversion Dam monuments.

5.4 Groundwater and Surface Water

Equity Silver personnel monitor groundwater and surface water quality. This data is reported in a separate document.

5.5 Main ARD Pond Slope

5.5.1 Survey Monuments

There are currently four survey monuments located near the Main ARD Pond: two on the slope and two on the south abutment of the Main ARD Pond Dam as shown on Figure 4. The monuments were installed before construction of the stabilizing berm in 2001. The survey data is given in Appendix E.

The four survey monuments showed very little movement over the past three to four years with the exception of SM-01 which has indicated an overall slow trend of movement since 2008 to the northwest (downslope) with positive vertical displacement (indicative of potentially rotational slope movement). In 2014, SM-01 experienced +0.5 cm and -0.2 cm of incremental horizontal and vertical movement, respectively, which is less than noted in previous years. The reduction in slope movement could likely be attributed to the repair of the plugged/leaking diversion culvert in mid 2013 that is routed through this area. Although no work is required at this time, the area surrounding SM-01 should continue to be monitored as part of the annual inspection process.

It should be noted that the control point for these monuments was changed in 2005. It was documented in the 2005 annual review that the apparent movement noted in some of the monuments in that year, most notably SM-05, was likely due to this change. The surveyors used the same control point and backsight azimuth in the 2005 through 2014 surveys and the readings for these years have been consistent.

It is recommended that the Main ARD Pond Slope monuments continue to be surveyed at least once per year, with visual observations made as recommended in Section 4.3.

5.5.2 Inclinometers

Two inclinometers were installed in the Main ARD Slope; the locations are shown on Figure 4. Summary plots of total displacement versus depth and total displacement versus time for the A-axis and B-axis for each inclinometer are given in Appendix E. The A-axis is oriented with the expected direction of slope movement and the B-axis orthogonal to that.

In 2008, the readings were taken with an inclinometer probe owned by AMEC. Because of the differences in sensor locations with the previous types of probes used, the 2008 readings were not considered to be comparable with the previous readings, even though the charts show similar displacement patterns. The 2008 readings have been used as initial readings for comparison with the subsequent readings.

In 2011, due to the unavailability of the AMEC inclinometer probe, a metric probe was rented from RST Instruments (RST Digital MEMs Probe SN DP0546). The metric probe has a sensor spacing of 0.5 m rather than 0.6 m for the AMEC imperial probe. In order to compare the 2011 probe date to previous records, a new baseline was synthesized from the previous baseline data with a 0.5 m data interval. The resulting baseline corrected data for 2011 compared well with the data acquired since 2008 using the AMEC probe with the exception of the B-axis data from Inclinometer 2001-02. A metric probe was again rented from RST Instruments in 2012, 2013 and 2014 (RST Digital Servo Probe SN DP0274) which produced comparable results to that of 2011.

In 2007, the readings in Inclinometer 2001-02 appeared to show a shift of approximately 3 mm in the deepest reading of the inclinometer. The upper 3 m of the inclinometer casing became loose in 2004 or 2005 and could be easily rotated. The 2008 through 2010 readings appear to be consistent however do not follow the trend of previous readings for the B-axis measurements. The displacement profile for 2011 through 2014 is consistent with the pre 2007 readings on both axes which generates suspicion in the B-axis data for the 2008 to 2010 readings using the AMEC probe. This is evident in the B-axis cumulative displacement plot for three separate elevations in which the 2011 through 2014 readings compare well with trends extrapolated from the pre 2007 data. Replacement of the inclinometer casing is not considered necessary at this time, but will be evaluated during future readings.

Surveys of the top of the inclinometer casings and adjacent piezometers show that there has been very little displacement at the ground surface at the location of the instruments from 2007 to 2014. It is recommended that the inclinometers continue to be read at least once annually as part of the annual review process using the RST metric inclinometer probe for ongoing monitoring of the Main ARD Pond slope. The need for and frequency of, instrumentation readings will be reassessed annually as part of the review process.

5.5.3 Piezometers

Three vibrating wire piezometers and one standpipe piezometer were installed in the ARD slope in 2001. Four additional standpipe piezometers were installed on and above the slope in October 2003. The locations of all the instrumentation installed in the ARD slope are shown on Figure 4. Plots for the piezometer data are given in Appendix E. The following tables give a summary of the piezometer information including completion stratum, tip elevation and ground/collar elevations.

Table 5.3: Summary of Vibrating Wire Piezometers on Main ARD Pond Slope

Vibrating Wire Piezometer	Collar Elevation (m)	Tip Elevation (m)	Completion Stratum
#61451	1210.5	1197.6	Weathered Bedrock/Till Interface
#61173	1210.5	1203.5	Till
#61534	1216.7	1209.2	Weathered Bedrock/Till Interface

Table 5.4: Summary of Standpipe Piezometers on Main ARD Pond Slope

Standpipe Piezometer	Ground Elevation (m)	Tip Elevation (m)	Completion Stratum
03-02A	1209.9	1192.2	Weathered Bedrock
03-02B	1210.0	1198.4	Till
03-03	1227.2	1218.9	Bedrock
03-04	1234.3	1222.7	Bedrock
EQ2001-02	1210.0	1195.3	Bedrock

The standpipe piezometers that are artesian are read using a pressure gauge attached to the top of the standpipe. The pressure gauge is left for a few hours to allow the reading to stabilize and then a pressure reading is taken. Unfortunately, under winter conditions, it is difficult to keep the standpipe from freezing, and readings can only be taken when the weather is warmer. The measured pore pressures in standpipes 03-02A, 03-02B, 03-04 and EQ2001-02 have generally remained within the same range over the last several years. The measured pore pressure readings in standpipe 03-03 have shown a slight decreasing trend since installation in

2003 but now appear to have stabilized to a relatively constant value. The measured pore pressures in the vibrating wire piezometers #61451, #61173 and #61534 have previously shown a very slight increasing trend however they now appear to have stabilized to within a relatively narrow band consistent with historical levels. The piezometers in the weathered bedrock continue to detect artesian pressures. The piezometers in the till continue to show that the piezometric surface in that layer is at approximately ground surface. There are no concerns with these readings.

It is recommended that the vibrating wire piezometers continue to be read at least once annually as part of the annual review process and the artesian standpipe piezometers read every other month when the weather allows. The need for and frequency of, instrumentation readings will be reassessed annually as part of the inspection process.

6.0 STATUS OF PREVIOUS RECOMMENDATIONS

Recommendations that were provided in the 2010 DSR and 2013 DSI are presented in Tables 6.1 and 6.2. The table also indicates if action has been taken on the recommendations thus far and for those that have not been actioned, whether the recommendation is still appropriate or not applicable.

Table 6.1: Summary of 2010 DSR Recommendations

PREVIOUS RECOMMENDATIONS	STATUS	
	Actions Taken	Validity
All Dams and Containment Structures		
Performed vegetation removal from the slopes and crests of the dams	Ongoing	Appropriate
Review of water control and discharge structures at all facilities, based on the ICC classifications presented in the 2010 DSR	Completed in 2011	
Update the site water balance based on newly collected data	Updated Annually	Appropriate
Installation of staff gauges for ease of pond water level monitoring including setting up maximum water levels to visually identify freeboard allowance at each location during inspections.	None	Appropriate
Complete dam-break analyses for the tailings impoundment, ARD Ponds and Bessemer Creek Silt Check	In Progress	
Complete dam stability analyses (where missing)	None	Appropriate
Update of the OMS manual	Completed in 2012	
Update of the ERP and EPP	Completed in 2012	
Review of ERP and EPP with staff and undertake simulation exercise.	EPP tested in 2013	
Preparation/documentation of a status evaluation for current procedures, and potential implementation and documentation of a modified short, medium and long term upgrade and replacement program for mechanical/electrical equipment and infrastructure across the site.	None	Not Applicable to DSI
Repair ruts, and level dam crests as part of the maintenance program. Provide adequate sloping of dam crest for drainage,	Repaired as needed	Appropriate
Evaluate the possibility to complete a LiDAR survey once every 5 years (to coincide with dam safety reviews), data to be used to monitor potential movements in all earth structures.	None	Appropriate
Complete next Dam Safety Review in 2015	DSR planned for 2015	Appropriate
Tailings Impoundment		
Implement emergency spillway improvements as soon as practically possible based on the results of the 2010 hydrological review.	Completed in 2013	
Develop a short term plan for riprap replacement along the upstream face of Dam No. 1 that would use engineered materials, for a more permanent repair and stable slope protection.	Riprap repaired as required	Appropriate
Confirm freeboard allowance and its suitability, based on current standards.	Completed in 2011	
Evaluate options for effective monitoring of active seepage at the toe of the dam at the left abutment, and the effectiveness of such system (monitoring weir, or other alternatives to be considered). Include monitoring readings and analysis in the annual dam safety inspection reports.	None, pumping records used as surrogate	Appropriate
No. 1 Seepage Pond Dam		
Review the fuse plug integrity and its potential for erosion.	Completed in 2011	
Review crest elevation of the fuse plug in relation to the dam crest elevation and the small channel invert elevation.	Completed in 2011	
Consider replacing the fuse plug with a permanent spillway.	None	Appropriate

PREVIOUS RECOMMENDATIONS	STATUS	
	Actions Taken	Validity
Dam No. 3		
Evaluate and implement removal of a beaver dam / accumulation of vegetation and deadfall located at the upstream face of the dam	Removed in 2011	
Review spillway invert elevation adequacy.	Completed in 2011	
Main ARD Dam		
Closely monitor slump that developed on the inner face of the containment structure.	Ongoing	Appropriate
Bessemer Creek Silt Check Dam		
Review and evaluate removal and management practices for the accumulated silt at this dam site; evaluate and implement optimum frequency for silt removal; increase frequency of silt removal from the pond, as required.	None	Appropriate

Table 6.2: Summary of 2013 Recommendations

PREVIOUS RECOMMENDATIONS	STATUS	
	Actions Taken	Validity
Any remaining shrubs and small trees should be removed from the crests and slopes of dams in order to minimize root intrusion into embankment zones as well as to facilitate adequate visual inspection of the various earthfill structures and associated reservoir boundaries.	Ongoing vegetation maintenance	Appropriate
The Berzelius Diversion should be inspected and cleaned out on an annual basis to remove accumulated sediment with repairs made when required.	Ongoing Maintenance	Appropriate
The sediment accumulation at the outlet of the ARD collection ditch into the No.1 Sump Pond should be removed in order to maintain sufficient live storage within the pond.	None	Appropriate
Continue to Inspect the ARD Surge Pond dam regularly for evidence of instability, such as cracks or erosion and repair/upgrade the leaking ditch at the left abutment to convey runoff and seepage flows off the hillside and into the ponds in a more controlled manner.	inspections being performed, no repairs performed to date	Appropriate
The slumped area on the inside (upstream) face of the South Dike forming the ARD Storage Pond adjacent to the “Closed Gate” sign and buried road culvert should be repaired with compacted till material at the earliest convenience and the area monitored regularly throughout normal pond operations for any sign of renewed slumping or internal erosion.	None	Appropriate
The adequacy of the Lu Lake spillway should be reviewed in the context of the increased ICC rating of “significant” based on recent (2013) survey data that suggests freeboard of only 0.6 m.	In progress	Appropriate
Upgrade the spillways of the Main ARD and ARD Surge ponds as per 2010 hydraulic structures review recommendations.	Design criteria under review	Appropriate
Schedule the upgrades for the remaining water management structures for further design and implementation based on the priority level or classification of the individual structure; the next highest priorities being upgrades to the No. 1 Dam Seepage Pond and Getty Creek Pond spillways.	None	Appropriate

7.0 2014 DSI CONCLUSIONS AND RECOMMENDATIONS

On the basis of the operational and monitoring information provided by Goldcorp and the site inspection performed throughout 2014, AMEC considers that the performance of the tailings impoundment and water management facilities continues to be satisfactory.

The seepage at all observable locations along the toes of the tailings dams appears to be running clear and free of suspended solids. Deformation monitoring data for the tailings impoundment and Main ARD Pond slope continue to be within acceptable ranges. Recommendations pertaining to the 2014 DSI are provided in Table 7.1.

In addition to continuing to implement the surveillance program as per the OMS Manual, the following additional recommendations are made for the continued safe operation of the TMF.

Table 7.1: Summary of Recommendations for 2014 DSI

No.	2014 DSI Recommendations
2014-01	Upgrade the spillways of the Main ARD and ARD Surge ponds to coincide with current dam safety requirements.
2014-02	Schedule the upgrades for the remaining water management structures for further design and implementation based on the priority level or classification of the individual structure; the next highest priorities being upgrades to the No. 1 Dam Seepage Pond and Getty Creek Pond spillways.
2014-03	The slumped area on the inside (upstream) face of the South Dike forming the ARD Storage Pond adjacent to the “Closed Gate” sign and buried road culvert should be repaired at the earliest convenience and the area monitored regularly throughout normal pond operations for any sign of renewed slumping or internal erosion.
2014-04	Any remaining shrubs and small trees should continue to be removed from the crests and slopes of dams in order to minimize root intrusion into embankment zones as well as to facilitate adequate visual inspection of the various earthfill structures and associated reservoir boundaries.
2014-05	Continue to Inspect the ARD Surge Pond dam regularly for evidence of instability, such as cracks or erosion and repair/upgrade the leaking ditch at the left abutment to convey runoff and seepage flows off the hillside and into the ponds in a more controlled manner.
2014-06	Remove accumulated sediment from Bessemer Creek Silt Check reservoir.
2014-07	The Berzelius Diversion should continue to be inspected and cleaned out on an annual basis to remove accumulated sediment with repairs made when required.
2014-08	The sediment accumulation at the outlet of the ARD collection ditch into the No.1 Sump Pond should be removed in order to maintain sufficient live storage within the pond.
2014-09	The OMS Manual and associated EPP should be updated based on the results of the dam breach and inundation studies currently underway.

8.0 LIMITATIONS AND CLOSING REMARKS

Recommendations presented herein are based on a geotechnical evaluation of the findings of the site inspection noted. If conditions other than those reported are noted during subsequent phases of the project, AMEC should be notified and be given the opportunity to review and revise the current recommendations, if necessary.

This report has been prepared for the exclusive use of Goldcorp Canada Ltd. for specific application to the area within this report. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibility of such third parties. AMEC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. It has been prepared in accordance with generally accepted soil and dam engineering practices. No other warranty, expressed or implied, is made.

Respectfully submitted,

AMEC Environment & Infrastructure,
a Division of AMEC Americas Ltd.

Original hard copies signed and sealed by
Andrew Witte, M.Eng., P.Eng.

Andrew Witte, M.Eng, P.Eng.,
Senior Geotechnical Engineer

Reviewed by:

Original hard copies signed by
Steve Rice, P.Eng.

Steve Rice, P. Eng.
Principal Engineer

REFERENCES

AMEC Earth & Environmental Limited. (2002). Equity Division Water Management Project ARD Management System. Memo dated 20 December 2002.

AMEC Earth & Environmental Limited. (2003a). Equity Mine Main ARD Pond "Landslide" 3rd Party Review of Short Term Risks. 15 January 2003.

AMEC Earth & Environmental Limited. (2003b). 2002 Construction Summary Report South Dyke, Dams No. 2 and 3 Equity Water Management Project 2002. February 2003.

AMEC Earth & Environmental Limited. (2004a). Tailings Impoundment and Water Management Structures 2003 Annual Review. Report dated 19 March 2004.

AMEC Earth & Environmental Limited. (2004b). Main ARD Pond Slope 2004 Site Investigation and Long-term Stability Assessment. Letter report dated 26 November 2004.

AMEC Earth & Environmental Limited. (2005a). Tailings Management Facility – 2004 Annual Review. Report dated 18 March 2005.

AMEC Earth & Environmental Limited. (2005b). Bessemer Creek Silt Check Dam Spillway Reconstruction FINAL. Letter report dated 25 October 2005.

AMEC Earth & Environmental Limited. (2006). Tailings Impoundment and Water Management Structures – 2005 Annual Review. Report dated 27 March 2006.

AMEC Earth & Environmental Limited. (2007). Tailings Impoundment and Water Management Structures – 2006 Annual Review. Report dated 12 March 2007.

AMEC Earth & Environmental Limited. (2008). Tailings Impoundment and Water Management Structures – 2007 Annual Review. Report dated 18 March 2008.

AMEC Earth & Environmental Limited. (2009a). Tailings Impoundment and Water Management Structures – 2008 Annual Review. Report dated 3 March 2009.

AMEC Earth & Environmental Limited (2009b). Diversion Pond Splitter Dike As-Built Report. Report Dated March 2009.

AMEC Earth & Environmental Limited. (2010). Tailings Impoundment and Water Management Structures – 2009 Annual Review. Report dated 16 March 2010.

AMEC Earth & Environmental Limited. (2011). Tailings Impoundment and Water Management Structures – 2010 Annual Review. Report dated 11 March 2011.

AMEC Environmental & Infrastructure. (2012). Tailings Impoundment and Water Management Structures – 2011 Annual Review. Report dated March 2012.

AMEC Environmental & Infrastructure. (2013). Tailings Impoundment and Water Management Structures – 2012 Annual Review. Report dated 15 March 2013.

AMEC Environmental & Infrastructure. (2014). Tailings Impoundment and Water Management Structures – 2013 Annual Review. Report dated 28 February 2014.

Hay & Company Consultants Inc. (1996). Shallow Water Covers- Equity Silver Base Information Physical Variables. MEND Report 2.11.15ab.

Klohn Crippen Consultants Ltd. (1994). Tailings Storage Facility 1993 Annual Report. 13 May 1994.

Klohn Crippen Consultants Ltd. (1995). Tailings Storage Facility 1994 Annual Report. 13 April 1995.

Klohn Crippen Consultants Ltd. (1996a). Tailings Storage Facility 1995 Annual Report. 25 March 1996.

Klohn Crippen Consultants Ltd. (1996b). Review of Water Management Structures Final Report. 18 April 1996.

Klohn Crippen Consultants Ltd. (2002a). Tailings Impoundment and Water Management Structures 2001 Annual Review. 19 April 2002.

Klohn Crippen Consultants Ltd. (2002b). Equity Silver, Main ARD Pond Landslide Geotechnical Data Summary Report Final Report. 30 April 2002.

Klohn Crippen Consultants Ltd. (2002c). Diversion Dam Stability Review-Revised. 07 November 2002.

Klohn Crippen Consultants Ltd. (2003). Tailings Impoundment and Water Management Structures 2002 Annual Review. 30 April 2002.

Klohn Leonoff Consulting Engineers. (1980). Tailings Storage Facilities. 27 August 1980.

Klohn Leonoff Consulting Engineers. (1984). Geotechnical Report Waste Dump Stability Review. February 24, 1984.

Klohn Leonoff Consulting Engineers. (1985a). Acid Mine Drainage Treatment System Design of Holding Ponds. 13 August 1985.

Klohn Leonoff Consulting Engineers. (1985b). Report of the Revised Tailings Disposal Plan and Modifications to Dam Design. 19 November 1985.

Klohn Leonoff Consulting Engineers. (1990). Stability Analyses of Tailings Dams- Maximum Sections. 20 June 1990.

FIGURES

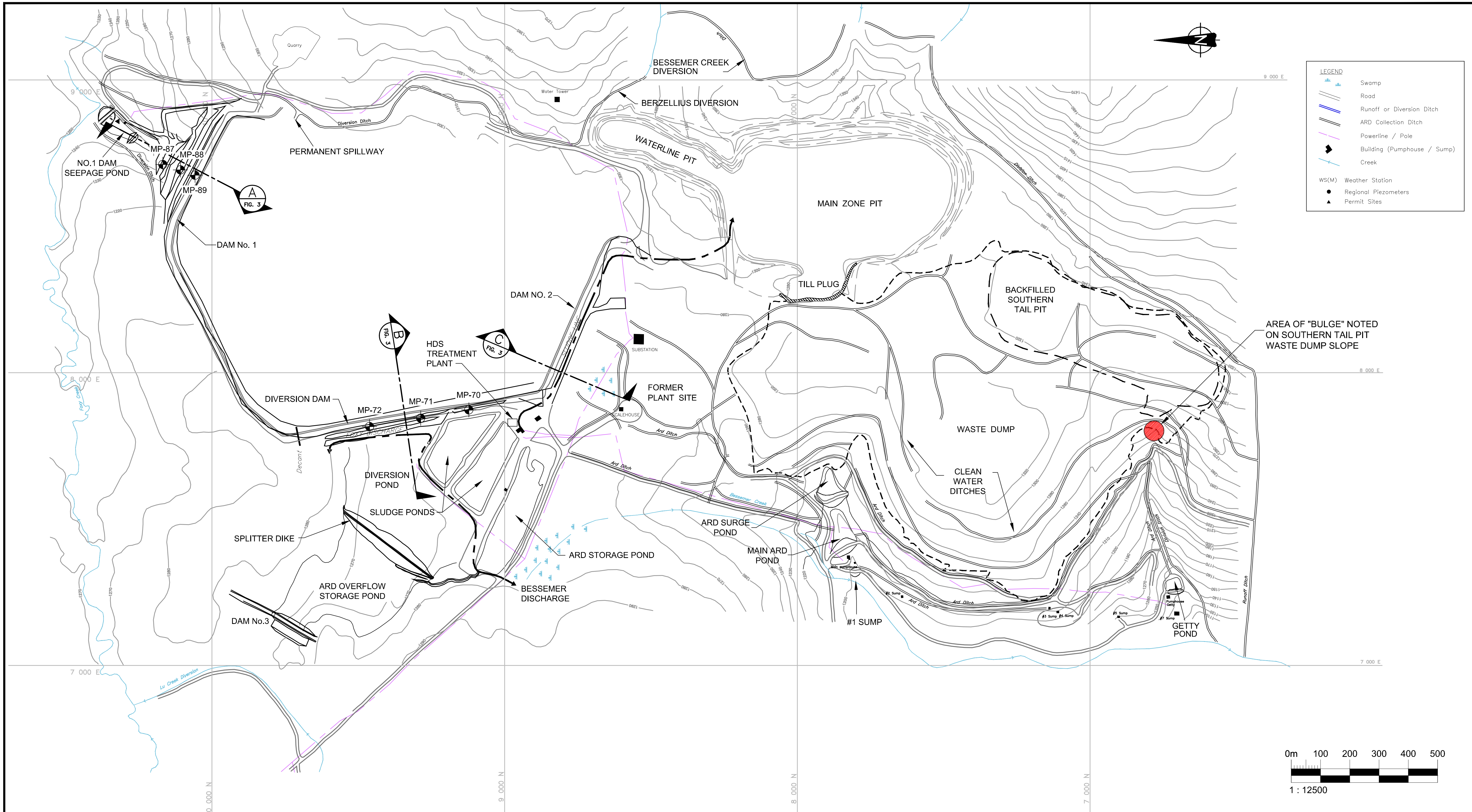
EQUITY SILVER MINE
2014 DAM SAFETY INSPECTION
DRAWING INDEX

FIGURE NUMBER	DESCRIPTION	REVISION NUMBER	DATE ISSUED
1	KEY MAP AND PROJECT LOCATION PLAN	A	03 OCT 2014
2	SITE PLAN	A	03 OCT 2014
3	TAILINGS IMPOUNDMENT REPRESENTATIVE DAM SECTIONS	A	03 OCT 2014
4	MAIN ARD POND SLOPE PLAN	A	03 OCT 2014

NOTE:
THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE AMEC ENVIRONMENT & INFRASTRUCTURE REPORT No. VM00276A.4.400 DATED OCTOBER 2014.

CLIENT: GOLDCORP — GOLDCORP CANADA LTD	DWN BY: TH CHK'D BY: AW	PROJECT: EQUITY SILVER MINE 2014 DAM SAFETY INSPECTION	DATE: OCTOBER 2014 PROJECT NO: VM00276A.4.400
AMEC Environment & Infrastructure Suite 600, 4445 Lougheed Highway Burnaby, BC, V5C 0E4 Tel. 604-294-3811 Fax 604-294-4664 amec	DATUM: - - PROJECTION: - - SCALE: AS SHOWN	TITLE: KEY MAP AND PROJECT LOCATION PLAN	REV. NO: A FIGURE NO: 1

*PLOT 1:1=A1 S:\PROJECTS\VM00276.03 – Equity Silver Mine\DRAWINGS\2010 Annual Review and Update\Phase 800 – Task 3 – 2010 Annual Review Figures\VM27603-2011-002.dwg – Fri. Feb. 25 8:21am 2011 (002) Tim.Hawker



NOTE:
THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE AMEC ENVIRONMENT & INFRASTRUCTURE REPORT No. VM00276A.4.400 DATED OCTOBER 2014.

CLIENT: GOLDCORP — GOLDCORP CANADA LTD

AMEC Environment & Infrastructure
Suite 600, 4445 Lougheed Highway
Burnaby, BC, V5C 0E4
Tel. 604-294-3811 Fax 604-294-4664

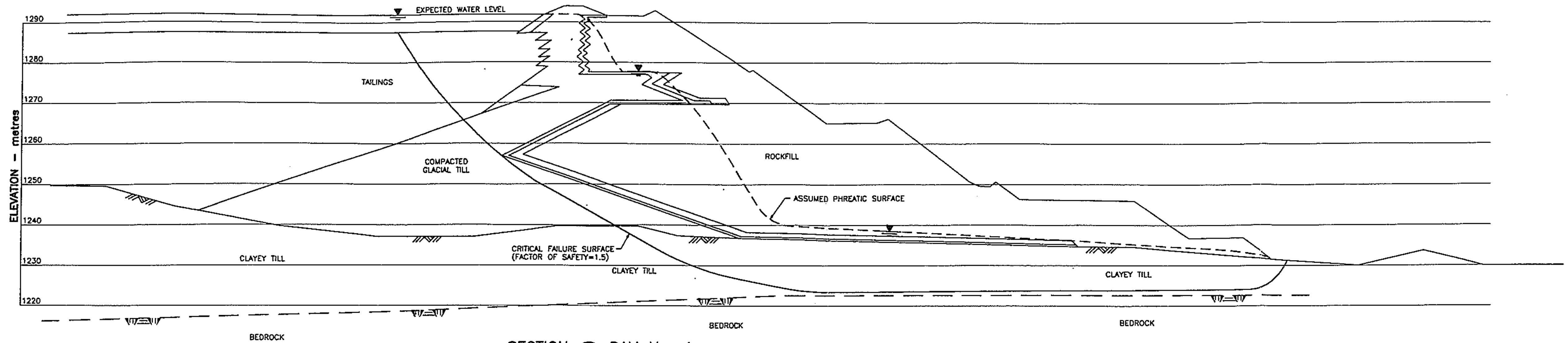
DWN BY:	TH
CHK'D BY:	AW
DATUM:	MINE
PROJECTION:	MINE
SCALE:	AS SHOWN

PROJECT: EQUITY SILVER MINE 2014 DAM SAFETY INSPECTION

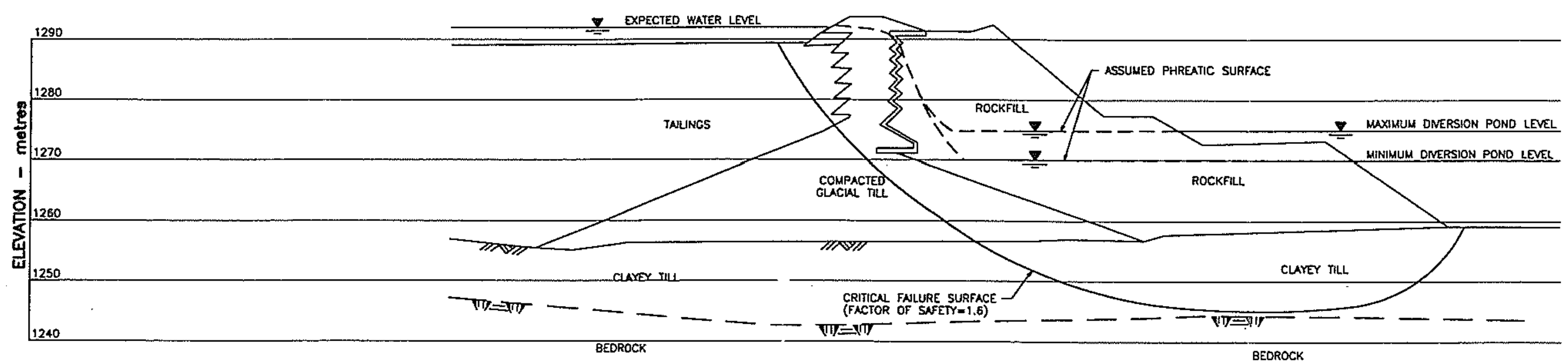
TITLE: SITE PLAN

DATE:	OCTOBER 2014
PROJECT NO:	VM00276A.4.400
REV. NO:	A
FIGURE NO:	2

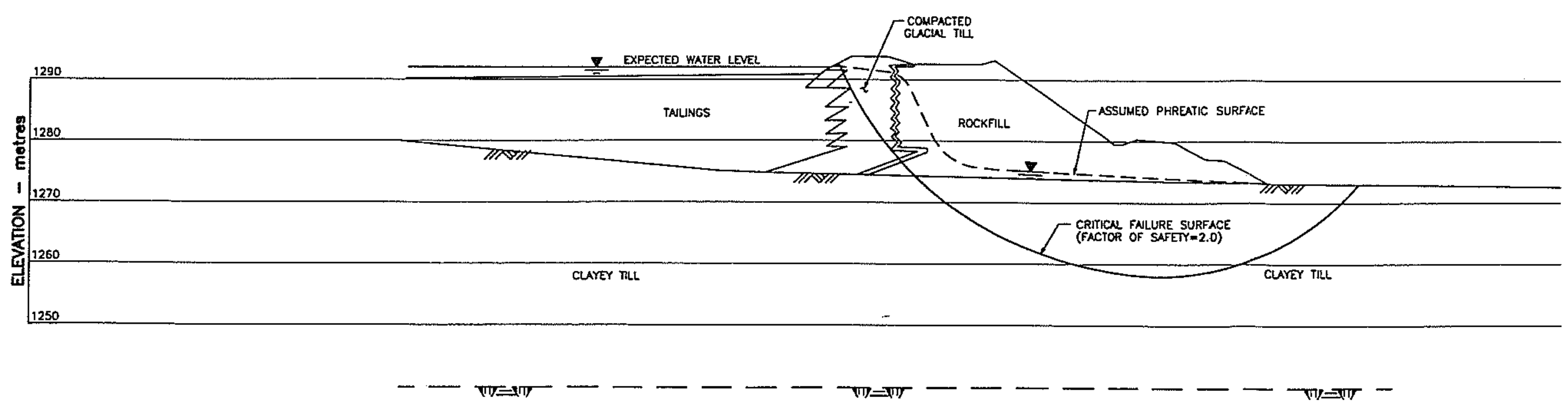
*PLOT 1:1=A1 S:\PROJECTS\VM00276.03 – Equity Silver Mine\DRAWINGS\2010 Annual Review and Update\Phase 800 – Task 3 – 2010 Annual Review Figures\VM27603-2011-002.dwg – Fri. Feb. 25 8:21am 2011 (002) Tim.Hawker



SECTION A/001 DAM No. 1



SECTION B/001 DIVERSION DAM



SECTION C/001 DAM No. 2

PARAMETER FOR STABILITY ANALYSIS

MATERIAL	UNIT WEIGHT (kN/m^3)	EFFECTIVE COHESION C' (kPa)	EFFECTIVE FRICTION ANGLE ø' (degrees)
TAILINGS	17.0	0	20
COMPACTED GLACIAL TILL	20.4	20	27
CLAYEY TILL	20.4	20	27
ROCKFILL	19.6	0	37.5

STABILITY ANALYSIS RESULTS FOR CRITICAL FAILURE SURFACES

MATERIAL	FACTOR OF SAFETY (BISHOP'S SIMPLIFIED)	
	STATIC	PSEUDOSTATIC (a=0.147g)
DAM No.1	1.5	1.07
DIVERSION DAM	1.6	1.14
DAM No.2	2.0	1.42

NOTES

1. AS–BUILT DAM SECTIONS PROVIDED BY EQUITY SILVER MINE.
2. STABILITY ANALYSES ASSUME STEADY STATE SEEPAGE.
3. STABILITY ANALYSES CARRIED OUT USING LIMIT EQUILIBRIUM COMPUTER PROGRAM SLOPE/W, USING BISHOP'S METHOD OF SOLUTION.
4. REVISION 1 FOR 1995 AUNUAL REVIEW.

NOTE:
THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE AMEC ENVIRONMENT & INFRASTRUCTURE REPORT No. VM00276A.4.400 DATED OCTOBER 2014.

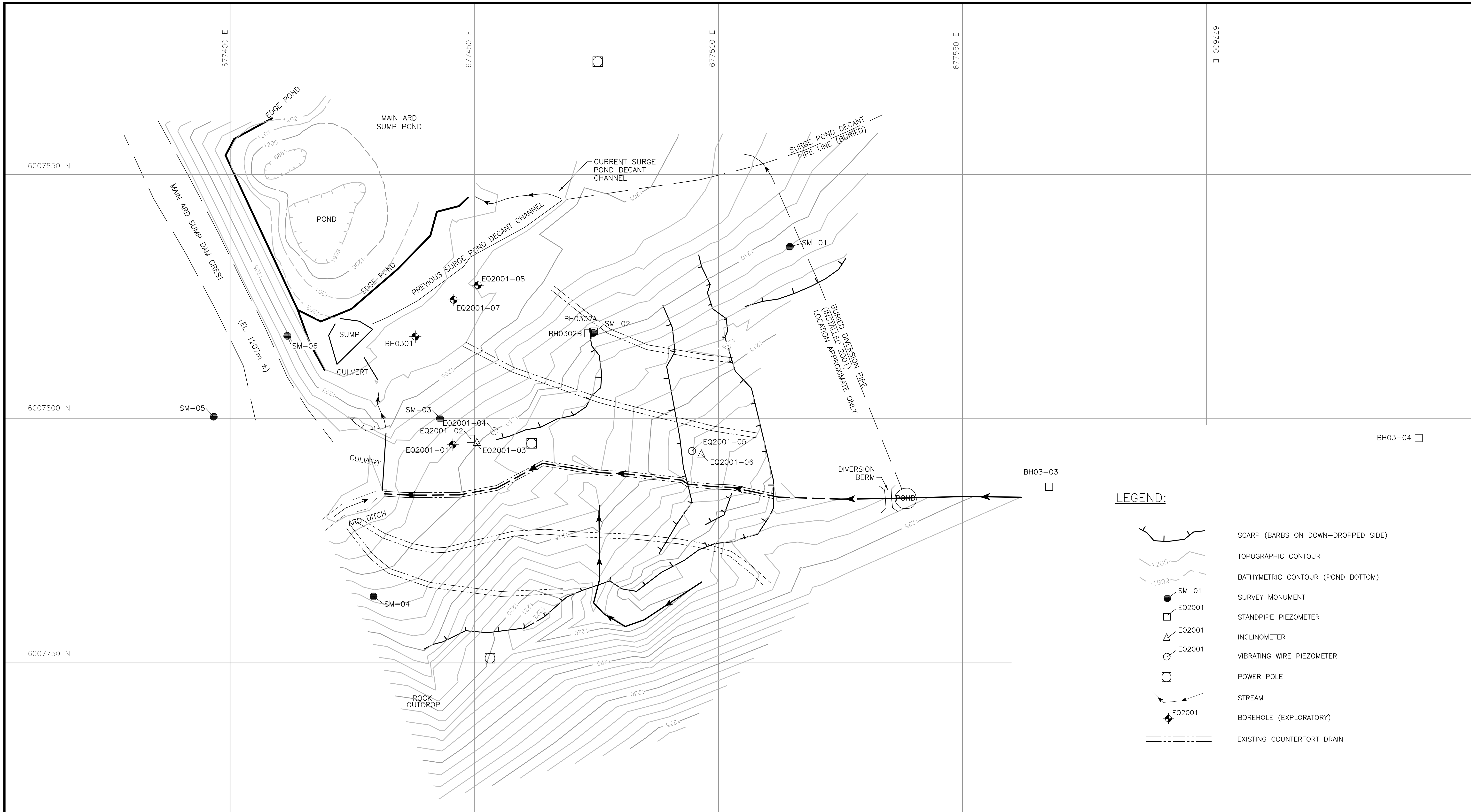
DAM SECTIONS REFERENCE: *KLOHN-CRIPPEN, PROJECT PB2147 23, TAILINGS DISPOSAL: 'STABILITY ANALYSIS AS-BUILT DAM SECTIONS', DRAWING NO: D-23003 R1, DATED MARCH 25, 1996.*

CLIENT: GOLDCORP CANADA LTD

AMEC Environment & Infrastructure
Suite 600, 4445 Lougheed Highway
Burnaby, BC, V5C 0E4
Tel. 604-294-3811 Fax 604-294-4664

DWN BY:	TH
CHK'D BY:	AW
DATUM:	--
PROJECTION:	--
SCALE:	AS SHOWN
PROJECT	EQUITY SILVER MINE 2014 DAM SAFETY INSPECTION
TITLE	TAILINGS IMPOUNDMENT REPRESENTATIVE DAM SECTIONS
DATE:	OCTOBER 2014
PROJECT NO:	VM00276A.4.400
REV. NO:	A
FIGURE NO:	3

*PLOT 1:1=A1 S:\PROJECTS\VM00276.03 – Equity Silver Mine\DRAWINGS\2010 Annual Review and Update\Phase 800 – Task 3 – 2010 Annual Review Figures\VM27603–2011–002.dwg – Fri. Feb. 25 8:21am 2011 (002) Tim.Hawker



NOTES:

1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE AMEC ENVIRONMENT & INFRASTRUCTURE REPORT No. VM00276A.4.400 DATED OCTOBER 2014.
2. TOPOGRAPHIC CONTOURS BASED ON A SEPTEMBER 7, 2001 SURVEY BY S. HOWARD AND ASSOCIATES.
3. INSTRUMENT LOCATIONS AND BATHYMETRY BASED ON AN OCTOBER 9, 2001 SURVEY BY S. HOWARD AND ASSOCIATES.
4. THE LOCATION OF BOREHOLES EQ2001-07 AND EQ2001-08 ARE APPROXIMATE ONLY.

CLIENT:	GOLDCORP CANADA LTD
DWN BY:	TR
CHK'D BY:	AW
DATUM:	NAD 27
PROJECTION:	UTM Zone 9
SCALE:	AS SHOWN
PROJECT	EQUITY SILVER MINE 2014 DAM SAFETY INSPECTION
TITLE	MAIN ARD POND SLOPE PLAN
DATE:	OCTOBER 2014
PROJECT NO:	VM00276A.4.400
REV. NO:	A
FIGURE NO:	4

AMEC Environment & Infrastructure
Suite 600, 4445 Lougheed Highway
Burnaby, BC, V5C 0E4
Tel. 604-294-3811 Fax 604-294-4664

APPENDIX A

Site Visit Photographs

Photo 1: Overview of Equity Mine site (Main Zone Pit in foreground and Tailings Pond in background). Taken August 29, 2006.

Photo 2: Aerial photograph of the Tailings Pond with Dam #1 Seepage Pond in foreground and treatment facilities in the background. Taken August 29, 2006.

Photo 3: Dam No. 1, view of the upstream slope and right abutment to the emergency spillway inlet.

Photo 4: Dam No. 1, view of the upstream slope and riprap protection looking east.

Photo 5: Dam No. 1, view of the upstream slope and riprap protection looking west.

Photo 6: Dam No. 1, view of the crest road bench and crest of dam looking west.

Photo 7: Dam No. 1, view of the dam crest bench, looking east.

Photo 8: Dam No. 1, view of downstream face on west side with clean water diversion and seepage collection ditches.

Photo 9: Dam No. 1, view of downstream shell

Photo 10: Dam No. 1, view of dam toe from left abutment.

Photo 11: Dam No. 1, view of dam of pooling water on toe bench.

Photo 12: Dam No. 1, view of the seepage collection ditch at the toe of the downstream face. Note vegetation cut down but not removed.

Photo 13: Dam No. 1, view of the seepage collection ditch at the toe of the downstream face. Note vegetation cut down but not removed.

Photo 14: Dam No. 1, close-up view of the seepage collection ditch at the toe of the downstream face. Note seepage water is clear.

Photo 15: Dam No. 1, view of downstream toe. Note active seepage into pond.

Photo 16: Dam No. 1, view of monitoring prism at dam toe.

Photo 17: Diversion Dam, panoramic view from Diversion Pond.

Photo 18: Diversion Dam, view of the downstream slope and pond at toe.

Photo 19: Diversion Dam, view of the upstream face and riprap protection.

Photo 20: Diversion Dam, view of the dam crest.

Photo 21: Dam No. 2, view of the downstream face.

Photo 22: Dam No. 2, view of downstream face from crest. Note ponded water at toe.

Photo 23: Dam No. 2, view of the upstream erosion protection.

Photo 24: Dam No. 2, view of dam crest.

Photo 25: Spillway Inlet, view from above right hand side. Note the erosion protection in the foreground and wave action in the pond.

Photo 26: Spillway channel, looking downstream.

Photo 27: Spillway inlet, right hand side erosion protection. Note wave action on shoreline.

Photo 28: Spillway inlet, left hand side erosion protection. Note wave action on shoreline.

Photo 29: Spillway channel and outlet into Berzelius Diversion Channel.

Photo 30: Berzelius Diversion, looking upstream from culvert crossing of spillway inlet.

Photo 31: Culvert crossing in Berzelius Diversion looking downstream.

Photo 32: Culvert crossing in Berzelius Diversion looking downstream.

Photo 33: Typical view of Berzelius channel adjacent tailings pond.

Photo 34: Typical view of Berzelius channel adjacent tailings pond.

Photo 35: Berzelius Diversion Channel at road crossing near water tower.

Photo 36: Berzelius Diversion Channel upstream of road crossing near water tower.

Photo 37: Berzelius Diversion Channel upstream of road crossing near water tower.

Photo 38: Berzelius Channel at the corner below the water tower.

Photo 39: ARD Surge Pond and Main ARD Pond, view from the waste dump above.

Photo 40: ARD Surge Pond, view of upstream slope and spillway inlet pipes.

Photo 41: ARD Surge Pond, view of the downstream slope.

Photo 42: ARD Surge Pond Dam crest. Note rut in foreground from tire track.

Photo 43: ARD Surge pond left abutment. Note water flowing alongside pipe through riprap.

Photo 44: Water flowing into ARD Surge Pond at left abutment.

Photo 45: ARD Surge Pond Dam, view down left abutment on downstream slope. Note surface water and saturated ground along pipe alignment.

Photo 46: ARD Surge Pond Spillway Pipes (inlet).

Photo 47: ARD Surge Pond Spillway outlet pipes. Note vegetation overgrowth.

Photo 48: ARD Surge Pond Spillway downstream of outlet pipes. Note vegetation overgrowth and obstructed culvert inlet that discharges into the main ARD pond.

Photo 49: Inlet of culvert from ARD Surge Pond spillway to Main ARD pond. Note vegetation overgrowth obstructing inlet.

Photo 50: Main ARD Pond Dam, view of upstream side.

Photo 51: Main ARD Pond Dam, view of the downstream face. Note pump house at the toe.

Photo 52: Main ARD Pond, view from left abutment. Note old instability on far shore.

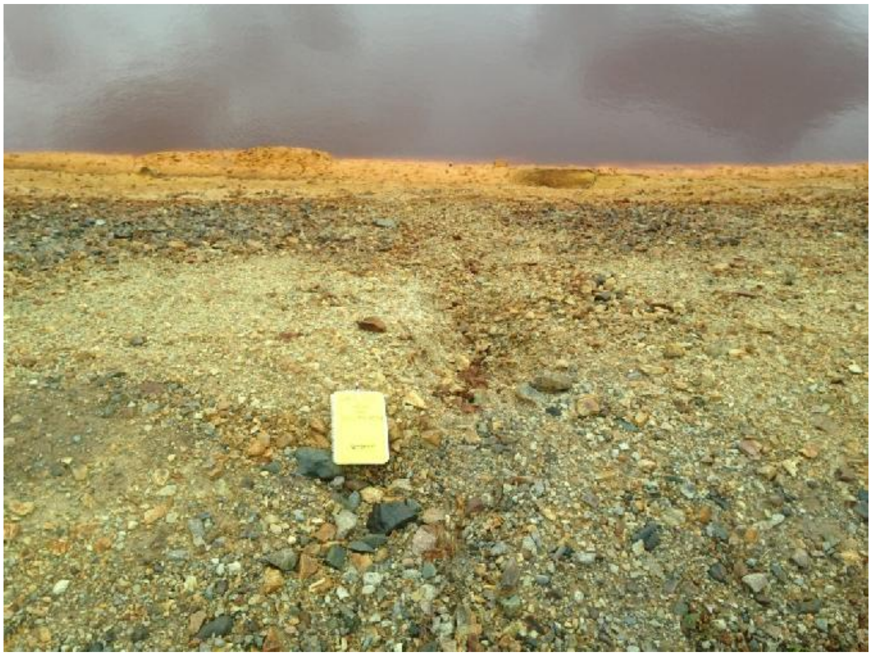


Photo 53: Rilling on upstream face of Main ARD Pond Dam face.

Photo 54: Main ARD Pond spillway culvert inlet.

Photo 55: Main ARD Pond Spillway, view of culvert outlet

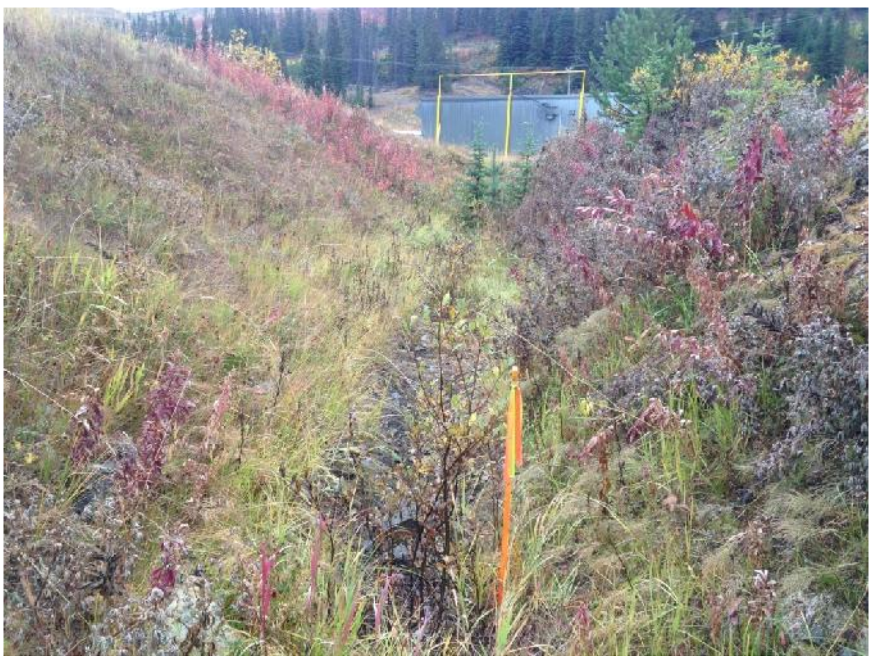


Photo 56: Main ARD Pond spillway. Note excessive vegetation.

Photo 57: Main ARD Pond Spillway, view of second culvert crossing. Note culvert inlets are partially crushed and obstructed with vegetation.

Photo 58: Main ARD Pond Spillway, view of second culvert crossing outlet channel

Photo 59: Main ARD Pond Slope, view from opposite side of Main ARD pond. Note active seepage was observed in the central counterfort drain, although less so than 2013.

Photo 60: Main ARD Pond Slope, view from top of slope toward Main ARD pond

Photo 61: No. 1 Sump Dam, view of upstream crest and road.

Photo 62: Upstream slope of No. 1 Sump Dam. Note sedimentation at ditch outlet.

Photo 63: No. 1 Sump Dam, spillway culvert and downstream face. Note excessive vegetation.

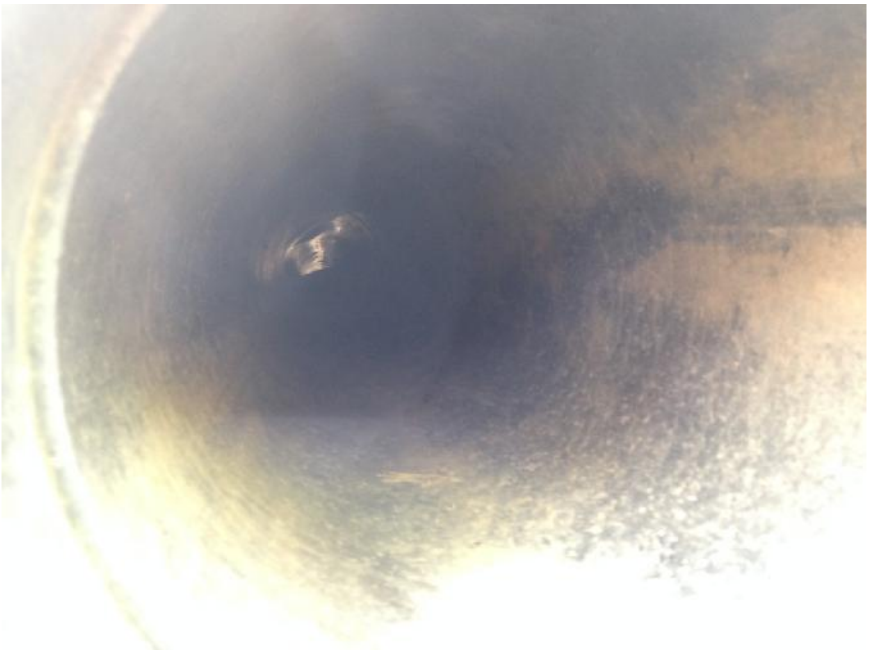


Photo 64: No. 1 Sump Dam spillway culvert, looking upstream. Note bend in pipe.

Photo 65: Dam No. 1 Seepage Collection Pond.

Photo 66: Dam No. 1 Seepage Collection Pond, view of downstream slope from right abutment.

Photo 67: Dam No. 1 Seepage Collection Pond, view of upstream slope from left abutment.

Photo 68: Dam No. 1 Seepage Collection Pond dam crest.

Photo 69: Dam No. 1 Seepage Collection Pond fuse plug, viewed from above left abutment.

Photo 70: Dam No. 1 Seepage Collection Pond, spillway channel looking downstream.

Photo 71: Getty Creek Sump Dam, view of the crest and downstream slope, from above right abutment.

Photo 72: Getty Creek Pond Dam; view of the dam crest, the emergency spillway (with riprap lining) on LHS of photo, and siphon system (HDPE pipe).

Photo 73: Getty Creek Pond Dam, view of the dam crest and upstream slope. Note siphon towards the left abutment and spillway channel in foreground.

Photo 74: Getty Creek Pond Dam, view of siphon system outlet.

Photo 75: Getty Creek Pond Dam; view of the dam crest at right abutment. Note minor erosion at outlet of crest ditch.

Photo 76: Dam No. 3, view of the crest and downstream face of the dam (with downstream bench). Note impounded water downstream of dam.

Photo 77: Dam No. 3, view of dam crest from right abutment.

Photo 78: Dam No. 3, view of upstream dam face and empty reservoir from right abutment.

Photo 79: Dam No. 3, view of the dam crest with emergency spillway in the foreground (lined with rockfill). Note spillway invert elevation almost the same as the crest elevation. Note vegetation growing in channel.

Photo 80: Bessemer Creek Silt Check Dam, view of dam crest and upstream face. Note spillway flowing in foreground and vegetation at right abutment.

Photo 81: Bessemer Creek Silt Check Dam, view of upstream face and pond from left abutment.

Photo 82: Bessemer Creek Silt Check Dam, view of dam crest and downstream face from right abutment.

Photo 83: Bessemer Creek Silt Check Dam, view of the downstream face and spillway.

Photo 84: Bessemer Creek Silt Check Dam, view of spillway inlet sill. Note overgrown vegetation on dam crest opposite spillway inlet.

Photo 85: Bessemer Creek Silt Check Dam spillway.

Photo 86: Bessemer Creek Silt Check Dam, repaired blocks in spillway.

Photo 87: ARD Storage Pond, view of pond and upstream side of dam, and South Dam on left hand side of photo. Note low water level.

Photo 88: ARD Storage Pond, view of mine access road and downstream side of South dam.

amec

Environment & Infrastructure

GOLDCORP CANADA LTD.

Site Photos, September 2014
2014 Dam Safety Inspection
Equity Silver Mine, Houston, BC

Drawn: N/A	Scale: N/A	Date: Oct 2014	Project:VM00276A.4.400	Page: A44

Photo 89: ARD Storage Pond south dam, view of upstream face opposite “Closed Gate” sign. Note slumping of upstream slope above water line.

Photo 90: ARD Storage Pond south dam, view of inlet to road culvert (inlet covered with large rock) adjacent to “Closed Gate” sign.

amec Environment & Infrastructure

GOLDCORP CANADA LTD.

Site Photos, September 2014
2014 Dam Safety Inspection
Equity Silver Mine, Houston, BC

Drawn: N/A	Scale: N/A	Date: Oct 2014	Project:VM00276A.4.400	Page: A45

Photo 91: ARD Storage Pond south dam, view of outlet of road culvert opposite “Closed Gate” sign. Minor flow observed from culvert.

Photo 92: ARD Storage Pond, inlet to emergency overflow trench.

Photo 93: ARD Storage Pond, emergency overflow trench

Photo 94: Splitter Dike, view from Diversion Pond side.

Photo 95: Splitter Dike, view from the north abutment at the Emergency Pond side.

Photo 96: Splitter Dike, view from the north abutment crest. Note low water level on both sides.

Photo 97: Splitter Dike, view from the south abutment crest. Note low water level on both sides.

Photo 98: Main ARD Collection Ditch typical view upstream of weir.

Photo 99: Main ARD Collection Ditch. Note sediment accumulation in the ditch from ARD side drainage.

Photo 100: Main ARD Collection Ditch Bypass Pipe outlet.

Photo 101: Main ARD Collection Ditch Bypass Pipe inlet.

Photo 102: Southern Tail Pit Bulge, looking North from below.

Photo 103: Lu Lake North Dam, view of dam crest from left abutment. Note dam crest has been graded and access to dam crest restricted with barriers.

Photo 104: Lu Lake North Dam downstream slope, view from left abutment.

Photo 105: Lu Lake North Dam, view of upstream face and erosion protection looking towards the left abutment.

Photo 106: Lu Lake South Dam, view of dam crest from spillway inlet channel.

Photo 107: Lu Lake South Dam crest and downstream slope, view from right abutment. Note ponded water at toe and vegetation on slope.

Photo 108: Lu Lake South Dam, view of upstream face and erosion protection looking towards the left abutment.

Photo 109: Lu Lake spillway inlet channel looking downstream.

Photo 110: Lu Lake spillway weir. Note wood being removed to lower level, and waterline visible on sidewall.

APPENDIX B

Climate Data and Snow Pack Analysis

Table B-1. Summary of Precipitation Records 1985-2014

YEAR	JAN		FEB		MAR		APR		MAY		JUN	JUL	AUG	SEP		OCT		NOV		DEC		TOTAL
	SNOW	RAIN	SNOW	RAIN	SNOW	RAIN	SNOW	RAIN	SNOW	RAIN	RAIN	RAIN	RAIN	SNOW	RAIN	SNOW	RAIN	SNOW	RAIN	SNOW	RAIN	PPT
1985	19.5		47.5		26.2		4.0	15.0		27.9	78.6	22.8	25.7		47.1	44.2	29.0	11.8		10.2		409.5
1986	45.9		35.4		44.2		1.2			24.3	89.6	29.7	24.0		89.3	2.0	41.6	45.0	9.0	23.2		504.4
1987	69.0		26.9		29.4		14.0			41.8	15.6	102.7	38.9		33.8	1.0	60.0	27.2	41.1	25.8		527.2
1988	83.2		37.5		11.1		19.1		4.0	35.0	100.0	20.9	72.0	4.9	66.2	27.6	39.2	48.4		93.0		662.1
1989	83.0		17.0		65.0		22.5	2.0	4.0	35.0	56.1	71.1	108.4		32.0	12.6	58.5	22.0	33.8	77.0		700.0
1990	54.5		65.3		59.4		8.0		10.0	33.0	92.9	67.9	28.3		11.8	43.0		78.0		37.0		589.1
1991	1.0		41.5		35.4		8.5	4.4		27.7	89.5	69.5	41.6		13.1	36.5	41.0	85.7	15.0	121.7		632.1
1992	67.0		62.0		6.5	1.4	23.0	18.6	1.9	27.7	36.8	35.6	21.2	3.0	58.9	33.5	43.7	43.2	2.0	71.0		557.0
1993	27.0		4.0		12.0	2.0	19.7	24.4		74.0	140.3	102.6	61.7		10.6	6.0	23.5	39.0	21.5	52.5		620.8
1994	130.0	3.0	102.5		33.5		16.0	17.0	2.0	39.7	79.0	68.9	60.6	3.0	88.1	37.2	24.8	102.8		59.3		867.4
1995	38.5		33.4		50.4		25.2		2.0	24.3	51.3	67.9	85.1		15.2	33.1	39.0	69.7	0.4	91.5		627.0
1996	103.1	2.0	25.0		52.0		23.4	27.0		29.2	44.4	96.9	47.8		81.5	55.0	30.6	114.5		116.0		848.4
1997	81.0		34.0		98.0		24.5	29.7	10.6	24.0	57.8	84.6	37.4	1.0	92.4	27.0	51.1	31.5	3.0	77.5		765.1
1998	55.6		35.0		37.5	2.9	13.5	8.9		25.4	59.4	64.1	54.3		33.3	19.0	58.6	50.7		123.0		641.2
1999	75.2		58.5		81.0	3.5	17.5	10.6	31.1	38.2	108.2	79.4	114.1	13.0	47.1	24.4	9.7	35.7	2.0	46.1		795.3
2000	38.1		17.1		27.4		20.8	14.6	4.6	39.3	85.1	71.4	58.9	3.0	37.3	42.5	69.5	28.9	9.7	48.1		616.3
2001	55.4	7.0	28.3		44.1		2.2	15.7	41.0	50.2	60.7	42.0	68.8		60.0	44.7	11.8	89.6	15	50.7		687.2
2002	63.3		40.1		76.7		52.4		34.9	70.7	60.7	38.2	5.7		97.0		45.8	14.6	2.2	21.1		623.4
2003	52.5	8.5	26.6		23.6		13.8	12.2	2.5	22.3	69.1	64.1	50.3	3.4	77.7	30.7	75.9	71.0		13.5		617.7
2004	53.5		33.7		35.9	1.4	6.5	25.8	14.5	43.0	82.8	83.2	58.8	9.5	71.4	32.0	47.3	88.5	15.4	71.2	7.7	782.1
2005	30.6	18.7	36.4		29.5	9.8	49.6	6.6		28.5	63.1	121.1	55.8	4	43.9	31.3	34.1	32.5	9	36.1	1.9	642.5
2006	59.8		28		35.9		6.9		42.5	2.5	46.9	108.1	32.6	0.5	55.6	18.5	17	124.0		80.7		659.5
2007	46.5		48.5	0.6	50.1	0.6	38	30.3	15.0	14.6	150.2	97.1	93.5		29.6	43.3	43.7	79.0	7.8	74		862.4
2008	27.2		33.5		32.4		11.6			25.9	31.9	44.5	106.4		39.0	33.0	20.9	74.5	13.7	41.6	1.2	537.3
2009	76.0		31.2		38.1		41.3	14.5	11.5	34.2	37.8	82.1	21.1	1	75.1	54.2	36.5	70.9	7	57.5	0	690.0
2010	53.4	4.4	27.7		11		22.8	11.3	23.5	44.7	38.1	19.6	35.9		123.6	28.3	41.2	63.6		45.8		594.9
2011	90.8	14.5	45.7		69.8		84.3		50.5	71.1	71.1	113.5	24.9		66.2	9.0	13.6	115.5	3	65.7		909.2
2012	69.4		74.8		27.7		26.1	40.7	14.0	10.1	86.9	32.1	67.3		18.8	72.8	31.7	50.2	3.3	65		690.9
2013	41.6		37.2		30.3		36		60.5		111.5	39.3	109.2		72.9	7.9	40.3	51.3		67.6		705.6
2014	62.2		42		54		31.5	10.6	3.7	50.4	38.8	37.4	14									344.6
1985-2014	58.5	8.3	39.2	0.6	40.9	3.1	22.8	17.0	18.3	35.0	71.1	65.9	54.1	4.2	54.8	30.4	38.6	60.7	11.3	60.8	2.7	657.0
1990-2014	58.1	8.3	40.5	0.6	42.1	3.1	24.9	17.9	19.8	35.4	71.8	69.2	54.2	4.1	55.0	33.2	37.0	66.9	8.1	63.9	2.7	676.3

Note: Average values used for May '88, Oct '88, May '89, Feb '91, Mar '91

TABLE B-2
EQUITY DIVISION WEATHER RECORDS

PERIOD	TEMPERATURE -C MAX.	TEMPERATURE -C MIN.	TEMPERATURE -C AVG.	HEATING DEG. DAYS	PRECIPITATION RAIN MM.	PRECIPITATION SNOW CM.	SNOW PACK LU LAKE SITE SNOW PACK CM.	SNOW PACK LU LAKE SITE WATER EQUIV CM	SNOW PACK EQUITY SITE SNOW PACK CM.	SNOW PACK EQUITY SITE WATER EQUIV CM
1982										
JAN	-7.4	-21.6	-14.5			104.0	100.6	21.8	116.2	25.8
FEB	-3.3	-14.2	-8.8			70.0	124.0	32.4	132.5	33.0
MAR							111.2	31.2	137.8	39.8
APR							106.0	35.2	119.6	38.8
MAY							36.8	12.6	54.0	19.2
JUNE	20.3	7.1	13.7		36.4					
JULY	18.1	8.6	13.4		56.7					
AUG	15.8	7.5	11.7		52.5					
SEPT	13.7	5.7	9.7		62.6					
OCT	5.1	-1.5	1.8		47.5	28.0				
NOV	-4.4	-11.7	-8.1	780.5		42.8				
DEC	-5.0	-11.7	-8.4	817.0		28.4	61.2	10.4	69.6	13.0
Avg/Tot	5.9	-3.5	1.2		255.7	273.2				
1983										
JAN	-2.7	-11.4	-7.1	768.7		29.5	78.0	18.4	94.0	23.2
FEB	0.4	-7.2	-3.4	599.5		26.0	77.0	20.4	94.2	25.6
MAR	2.7	-9.0	-3.2	654.2		9.5	84.6	21.0	94.4	29.8
APR	8.7	-1.9	3.4	438.5		2.5	54.6	18.0	61.6	21.2
MAY	14.4	4.4	9.4	279.5	12.0					
JUNE	13.4	4.0	8.7	279.5	122.4	1.0				
JULY	16.4	5.4	10.9	219.6	90.1					
AUG	15.9	5.2	10.6	233.5	38.6					
SEPT	10.6	0.6	5.6	371.0	59.6					
OCT	11.3	-2.4	4.5	420.5	24.5	6.2				
NOV	-0.9	-7.0	-4.0			47.1				
DEC	-9.2	-18.2	-13.8	986.0		45.7	64.2	11.8	82.0	17.2
Avg/Tot	6.8	-3.1	1.8		347.2	167.5				
1984										
JAN	-1.4	-10.1	-5.8	735.5		32.2	86.0	18.0	96.6	24.4
FEB	0.8	-5.8	-2.5	595.0		89.2	96.6	23.8	118.8	31.4
MAR	4.4	-4.1	0.2	551.6	0.2	24.0	101.4	27.2	119.2	36.0
APR	8.7	0.9	4.8	396.0		5.0	84.2	26.4	102.8	35.2
MAY	8.0	-0.8	3.6	450.2		1.5	21.4	7.4	50.4	18.2
JUNE	13.2	3.8	8.5	284.0	36.2					
JULY	16.8	4.9	10.9	224.0	37.2					
AUG	15.9	5.3	10.6	233.0	115.3					
SEPT	8.7	0.4	4.6	404.5	80.2					
OCT	4.0	-5.2	-0.6	576.0	51.5	12.3				
NOV	-2.2	-9.8	-6.0	720.0		18.0				
DEC	-10.0	-16.9	-13.5			39.7	75.6	17.2	92.0	19.8
Avg/Tot	5.6	-3.1	1.2		320.6	221.9				

PERIOD	TEMPERATURE -C MAX.	MIN.	AVG.	HEATING DEG. DAYS	PRECIPITATION RAIN MM.	SNOW CM.	SNOW PACK LU LAKE SITE SNOW PACK CM.	LU LAKE SITE WATER EQUIV CM	EQUITY SITE SNOW PACK CM.	EQUITY SITE WATER EQUIV CM
1985										
JAN	0.4	-8.1	-3.9		10.0	9.5	75.8	20.6	81.0	23.4
FEB	-1.9	-12.2	-7.1	701.0		47.5	104.6	25.4	117.0	32.4
MAR	-1.0	-8.7	-4.9	708.2		26.2	114.4	32.4	125.0	36.2
APR	4.1	-6.0	-1.0	568.0	15.0	4.0	NA	NA	95.8	41.5
MAY	16.2	7.2	11.7	194.8	27.9				53.4	17.8
JUNE	13.8	2.8	8.3	291.4	54.6	24.0				
JULY	19.5	6.5	13.0	158.1	22.8					
AUG	16.2	4.4	10.3	239.1	25.7					
SEPT	11.9	1.8	6.9	338.3	47.1					
OCT	3.1	-3.3	-0.1	561.0	29.0	44.2				
NOV	-9.0	-17.3	-13.2	933.7		11.8				
DEC	1.0	-7.5	-3.3	659.8		10.2	NA	NA	63.0	15.6
Avg/Tot	6.2	-3.4	1.4		232.1	177.4				
1986										
JAN	-1.6	-6.9	-4.3	690.2		45.9	NA	NA	98.8	24.8
FEB	-6.2	-13.8	-10.0	783.0		35.4	NA	NA	120.2	32.0
MAR	3.3	-4.8	-0.8	583.3		44.2	101.6	26.2	123.2	37.6
APR	4.0	-4.9	-0.5	553.8		1.2	NA	NA	122.2	42.4
MAY	8.3	-0.2	4.1	433.1	24.3		36.8	13.0	62.8	21.4
JUNE	14.8	3.3	9.1	268.9	89.6					
JULY	16.5	5.7	11.1	214.5	29.7					
AUG	19.2	6.9	13.1	155.9	24.0					
SEPT	9.7	2.3	6.0	360.4	89.3					
OCT	9.1	2.7	5.9	375.2	41.6	2.0				
NOV	-1.8	-9.1	-5.5	700.1	9.0	45.0				
DEC	-1.3	-9.1	-5.2	720.6		23.2	68.0	15.4	74.0	18.6
Avg/Tot	6.2	-2.3	1.9		307.5	196.9				
1987										
JAN	-2.3	-8.5	-5.4	724.5		69.0	87.0	17.8	96.0	25.6
FEB	-0.3	-6.4	-3.4	597.7		26.9	95.0	25.6	110.0	32.2
MAR	0.9	-6.7	-2.9	647.9		29.4	96.0	30.2	111.0	38.6
APR	5.1	-3.1	1.0	509.5		14.0	78.0	24.8	98.0	38.8
MAY	9.4	0.0	4.7	412.2	41.8		NIL	NIL	17.0	7.6
JUNE	15.3	3.4	9.4	265.4	15.6					
JULY	18.3	7.3	12.8	161.1	102.7					
AUG	16.2	5.7	11.0	218.1	38.9					
SEPT	12.3	5.1	8.7		33.8					
OCT	5.8	0.0	2.9		60.1	1.0				
NOV	1.0	-3.2	-1.1		41.1	27.2				
DEC	-4.2	-8.8	-6.5			25.8	43.0	10.0	69.6	13.0
Avg/Tot	6.5	-1.3	2.6		334.0	193.3				

PERIOD	TEMPERATURE -C MAX.	TEMPERATURE -C MIN.	TEMPERATURE -C AVG.	HEATING DEG. DAYS	PRECIPITATION RAIN MM.	PRECIPITATION SNOW CM.	SNOW PACK LU LAKE SITE SNOW PACK CM.	SNOW PACK LU LAKE SITE WATER EQUIV CM	SNOW PACK EQUITY SITE SNOW PACK CM.	SNOW PACK EQUITY SITE WATER EQUIV CM
1988										
JAN	-6.6	-13.3	-10.0	869.7		83.2	78.0	16.2	88.0	20.0
FEB	-2.2	-12.2	-7.2	731.0		37.5	82.0	26.0	96.0	27.2
MAR	1.2	-6.6	-2.7	642.1		11.1	95.8	29.6	116.8	36.2
APR	6.5	-4.4	1.1	507.8		19.1	58.0	20.2	71.2	29.0
MAY	9.1	0.2	4.7	413.4					26.0	9.4
JUNE	11.7	2.1	6.9	329.9	100.0					
JULY	14.4	4.4	9.4	266.4	20.9					
AUG	15.8	6.5	11.2	211.0	72.0					
SEPT	11.5	3.1	7.3	325.6	66.2	4.9				
OCT	MISSING DATA									
NOV	-1.0	-5.1	-3.1	631.9		48.4				
DEC	-3.4	-10.0	-6.7	764.5		93.0	77.0	19.0	85.4	22.8
Avg/Tot	4.8	-3.2	1.0		259.1	297.2				
1989										
JAN	-5.2	-11.8	-8.5	821.7		83.0	118.0	30.5	124.0	30.0
FEB	-6.3	-14.2	-10.3	790.4		17.0	108.0	32.4	118.0	33.6
MAR	-2.4	-9.8	-6.1	747.6		65.0	121.8	39.6	134.6	42.8
APR	6.7	-2.3	2.2	473.6	2.0	22.5	76.6	28.0	102.6	38.4
MAY	10.6	1.8	6.2	364.7	0.0	0.0	NIL		4.6	2.0
JUNE	15.7	5.9	10.8	215.1	56.1					
JULY	16.6	8.0	12.3	179.5	71.1					
AUG	16.6	8.5	12.6	168.3	108.4					
SEPT	14.4	5.8	10.1	236.6	32.0					
OCT	5.1	0.2	2.7	474.1	58.5	12.6				
NOV	-0.1	-4.8	-2.5	613.3	33.8	22.0				
DEC	-0.1	-5.8	-3.0	649.3		77.0				
Avg/Tot	6.0	-1.5	2.2		361.9	299.1				
1990										
JAN	-4.2	-10.2	-7.4	781.2		54.5	87.4	16.0	110.0	27.6
FEB	-4.6	-12.5	-8.6	736.4		65.3	87.0	26.0	105.8	30.8
MAR	2.4	-5.7	-1.7	610.1		59.4	95.0	29.6	116.0	41.2
APR	6.2	-2.5	1.9	477.1		8.0	68.8	26.0	93.4	35.2
MAY	10.6	1.9	6.3	363.5	33.0	10.0	32.4	13.6	58.2	24.4
JUNE	12.9	4.4	8.7	279.5	92.9					
JULY	19.2	8.3	13.8	138.4	67.9					
AUG	18.0	8.0	13.0	159.1	28.3					
SEPT	15.3	5.4	10.4	228.5	11.8					
OCT	1.4	-3.3	-1.0	587.8		43.0				
NOV	-2.7	-8.6	-5.7	709.8		78.0				
DEC	-6.2	-14.4	-10.3	872.6		37.0				
Avg/Tot	5.7	-2.4	1.6		233.9	355.2				

	TEMPERATURE -C				PRECIPITATION		SNOW PACK			
				HEATING	RAIN	SNOW	LU LAKE SITE		EQUITY SITE	
PERIOD	MAX.	MIN.	AVG.	DEG. DAYS			SNOW	WATER	SNOW	WATER
					MM.	CM.	PACK	EQUIV	PACK	EQUIV
							CM.	CM	CM.	CM
1991										
JAN	-6.9	-14.0	-10.5	881.5		1.0	102.3	29.0	124.8	40.0
FEB	1.1	-6.0	-2.5	572.8			108.2	29.0	132.8	43.2
MAR	-1.0	-10.4	-5.7	735.3			106.6	34.2	132.4	46.4
APR	6.9	-3.9	1.5	492.6	4.4	8.5	71.0	26.2	97.4	38.6
MAY	10.7	1.7	6.2	365.2	27.7					
JUNE	13.7	5.0	9.4	259.7	89.0	0.5				
JULY	15.3	5.9	10.6	226.8	69.5					
AUG	17.0	8.4	12.7	169.2	41.6					
SEPT	13.8	4.2	9.0	277.5	13.1					
OCT	4.1	-3.3	0.4	555.0	41.0	36.5				
NOV	-0.5	-5.4	-3.0	623.6	15.0	85.7				
DEC	3.5	-11.5	-3.5			121.7				
Avg/Tot	6.5	-2.4	2.1		301.3	253.9				
1992										
JAN	-1.0	-6.4	-3.7	673.7	1.0	66.0				
FEB	-2.1	-8.6	-5.4	695.2	0.0	62.0	99.0	32.8	128.8	46.2
MAR	5.3	-2.9	1.2	514.6	1.4	6.5	81.2	33.6	104.2	43.6
APR	5.7	-3.2	1.0		18.6	23.0	57.8	26.0	83.0	39.2
MAY	9.7	0.0	4.5		27.7	1.9				
JUNE	16.4	6.3	11.4	197.2	36.8					
JULY	17.6	7.2	12.4	171.3	35.6					
AUG	18.4	6.9	12.7	175.4	21.2					
SEPT	8.4	2.5	5.5	384.3	58.9	3.0				
OCT	4.3	-1.4	1.4		43.7	33.5				
NOV	-0.5	-5.7	-3.1	634.5	2.0	43.2				
DEC	-8.3	-12.5	-9.5		1.0	70.0				
Avg/Tot	6.2	-1.5	2.4		247.9	309.1				
1993										
JAN	-6.5	-15.9	-11.2			27.0				
FEB	-1.4	-10.1	-6.2		2.0	2.0	77.2	22.6	96.0	27.8
MAR	0.5	-7.8	-3.7	672.9	2.0	12.0	82.2	22.8	108.0	31.8
APR	5.4	-1.8	1.8	488.4	24.4	19.7	71.6	21.0	99.6	31.4
MAY	14.3	3.9	9.1	275.6	74.0					
JUNE	11.7	4.0	7.9	303.0	136.8	3.5				
JULY	15.4	6.1	10.8	223.6	102.6					
AUG	16.7	7.1	11.9	195.1	61.7					
SEPT	15.3	5.1	10.2	229.6	10.6					
OCT	8.0	0.5	4.2		23.5	6.0				
NOV	-0.8	-5.9	-3.4	638.0	21.5	39.0				
DEC	-1.4	-7.5	-4.5	701.8		52.5				
Avg/Tot	6.4	-1.9	2.2		459.1	161.7				

	TEMPERATURE -C				PRECIPITATION		SNOW PACK			
				HEATING	RAIN	SNOW	LU LAKE SITE		EQUITY SITE	
PERIOD	MAX.	MIN.	AVG.	DEG. DAYS			SNOW	WATER	SNOW	WATER
					MM.	CM.	PACK	EQUIV	PACK	EQUIV
							CM.	CM	CM.	CM
1994										
JAN	-0.7	-7.0	-3.9	678.0	3.0	130.0				
FEB	-8.2	-17.3	-12.8	883.7		102.5	108.2	32.2	126.0	39.0
MAR	1.6	-5.8	-2.2	620.9		33.5	102.4	33.6	118.8	41.2
APR	6.4	-2.5	2.0	484.7	17.0	16.0	61.8	25.0	85.2	36.6
MAY	10.9	1.1	6.0	377.6	39.7	2.0				
JUNE	12.5	4.0	8.2	287.0	79.0					
JULY	19.4	8.7	14.0	143.9	68.9					
AUG	18.3	7.9	13.1	152.1	60.6					
SEPT	11.8	4.0	7.8	304.1	88.1	3.0				
OCT	5.3	-1.4	2.0	498.6	24.8	37.2				
NOV	-2.3	-8.9	-5.5	709.2		102.8				
DEC	-4.6	-12.3	-8.4	819.1		59.3				
Avg/Tot	5.9	-2.5	1.7		381.1	652.9				
1995										
JAN	-5.7	-14.5	-10.1	883.5		38.9				
FEB	-3.0	-12.3	-7.6	715.9		33.0	94.0	23.4	117.4	34.0
MAR	0.8	-11.0	-5.1	719.5		50.4	99.2	30.0	125.4	43.2
APR	4.9	-5.3	-0.2	551.1		27.3	67.0	25.2		
MAY	13.4	1.8	7.6	320.0	24.3					
JUNE	16.9	4.4	8.1		51.1					
JULY	16.6	6.2	11.4	200.3	67.9					
AUG	13.3	4.1	8.7	287.3	85.1					
SEPT	17.1	3.8	10.4	227.4	15.2					
OCT	3.8	-1.8	1.0	521.6	38.6	34.5				
NOV	-2.0	-8.2	-5.1	703.6	0.4	89.7				
DEC	-7.0	-13.3	-10.2	863.5		105.0				
Avg/Tot	5.8	-3.8	0.7		282.6	378.8				
1996										
JAN	-11.7	-22.6	-17.2	1087.0	2.0	103.1				
FEB	-0.3	-11.7	-6.0	711.7		25.0	113.0	35.6	132.4	46.0
MAR	1.3	-8.8	-2.9			57.0	103.6	36.0	126.4	45.2
APR	4.2	-4.5	-0.1	541.2	27.0	23.4	96.6	35.6	122.6	48.0
MAY	6.6	-2.4	2.1	484.2	21.3	7.8	79.0	31.8		
JUNE	12.6	3.0	6.6		52.5					
JULY	15.9	5.2	10.5	235.6	97.3					
AUG	16.4	5.4	8.5		50.8					
SEPT	11.0	1.4	6.1	354.7	77.9					
OCT	4.6	-2.6	1.0	515.2	30.6	55.0				
NOV	-6.0	-13.3	-10.0			114.5				
DEC	-10.1	-17.7	-13.9			116.0				
Avg/Tot	3.7	-5.7	-1.3		359.4	501.8				

PERIOD	TEMPERATURE -C MAX.	MIN.	AVG.	HEATING DEG. DAYS	PRECIPITATION RAIN MM.	SNOW CM.	SNOW PACK LU LAKE SITE SNOW PACK CM.	LU LAKE SITE WATER EQUIV CM	EQUITY SITE SNOW PACK CM.	EQUITY SITE WATER EQUIV CM
1997										
JAN	-6.7	-13.8	-10.2			81.0				
FEB	-0.6	-8.4	-4.5			34.0	125.2	40.6	152.8	51.4
MAR	-3.1	-10.9	-7.0			98.0	149.4	48.4	186.0	64.0
APR	5.4	-5.7	-0.2		29.7	24.5	121.4	44.4	152.0	62.0
MAY	11.4	-0.2	5.7		24.0	10.6	80.0	33.0		
JUNE	13.7	3.6	6.0		57.8					
JULY	15.2	5.6	10.4		84.6					
AUG	17.7	6.9	12.3		37.4					
SEPT	12.7	2.8	5.8		92.4	1.0				
OCT	3.6	-2.0	0.8		51.1	27.0				
NOV	-1.1	-6.6	-3.9		3.0	31.5				
DEC	-1.4	-8.2	-4.8			77.5				
Avg/Tot	5.6	-3.1	0.9		380.0	385.1				
1998										
JAN	-8.0	-15.1	-11.7			55.6				
FEB	-1.2	-10.0	-5.6			38.0	80.8	20.6	112.3	31.4
MAR	-0.2	-8.8	-4.9		2.9	34.5	84.6	23.2	116.0	35.8
APR	4.1	-6.8	-1.5		10.9	14.5	61.6	19.6	93.0	31.0
MAY	14.3	3.2	6.7		25.4					
JUNE	15.5	6.8	9.1		63.6					
JULY	19.2	7.5	11.1		64.1					
AUG	15.0	4.5	6.8		54.3					
SEPT	12.2	2.8	4.8		32.5					
OCT	5.9	0.2	1.7		58.6	25.6				
NOV	-2.0	-7.0	-5.7			44.1				
DEC	-6.1	-12.1	-9.1			123.0				
Avg/Tot	5.7	-2.9	0.1		312.3	335.3				
1999										
JAN	-5.6	-10.9	-8.6			75.2				
FEB	-2.7	-9.3	-7.4			58.5	89.2	24.0	104.0	30.8
MAR	-0.8	-8.6	-6.3		3.5	81.0	111.0	31.4	128.0	37.2
APR	4.5	-4.9	-1.9		10.6	17.5	75.8	28.0	88.2	32.6
MAY	5.3	-1.9	-0.5		38.2	31.1				
JUNE	11.1	3.2	4.8		103.0	5.2				
JULY	15.3	6.0	8.2		79.4					
AUG	14.2	7.1	9.7		114.1					
SEPT	11.2	2.2	3.5		47.1	13.0				
OCT	4.2	-1.9	-0.7		9.7	24.4				
NOV	-2.1	-6.5	-4.5		2.0	35.7				
DEC	-2.4	-7.2	-5.4			46.1				
Avg/Tot	4.4	-2.7	-0.8		407.6	387.7				

PERIOD	TEMPERATURE -C MAX.	MIN.	AVG.	HEATING DEG. DAYS	PRECIPITATION RAIN MM.	SNOW CM.	SNOW PACK LU LAKE SITE SNOW PACK CM.	WATER EQUIV CM	EQUITY SITE SNOW PACK CM.	WATER EQUIV CM
2000										
JAN	-9.6	-15.0	-13.8			34.5				
FEB	-4.8	-13.3	-9.3			17.1	64.2	14.0	84.2	20.4
MAR	-0.6	-7.6	-6.0			27.4	81.0	20.2	103.8	28.8
APR	2.1	-4.7	-3.6		14.6	20.8	62.4	13.2	86.8	26.4
MAY	7.4	-0.9	1.2		40.3	3.6				
JUNE	12.5	4.4	6.7		85.1					
JULY	14.9	6.5	7.9		71.4					
AUG	14.6	6.0	8.0		58.9					
SEPT	10.1	2.3	2.7		37.3	3.0				
OCT	3.3	-1.8	-1.1		69.5	42.5				
NOV	-2.0	-5.7	-4.3		9.7	28.9				
DEC	-6.9	-11.8	-10.3		10.6	37.5				
Avg/Tot	3.4	-3.5	-1.8		397.4	215.3				
2001										
JAN	-3.8	-9.9	-7.3		7.0	55.4				
FEB	-6.2	-14.5	-12.0			28.3	71.4	17.4	98.2	27.2
MAR	-1.0	-9.1	-7.0			44.1	82.8	22.2	111.2	33.2
APR	3.1	-5.9	-3.8		15.7	2.2	68.8	21.0	93.2	28.4
MAY	4.9	-1.8	-0.1		50.2	41.0				
JUNE	10.8	1.9	4.5		60.7					
JULY	15.4	5.7	7.9		42.0					
AUG	15.5	5.9	7.8		68.8					
SEPT	9.7	2.6	3.4		60.0					
OCT	2.9	-2.2	-1.5		11.8	44.7				
NOV	-4.3	-7.8	-6.0		15.0	89.6				
DEC	-5.7	-11.5	-8.4			50.7				
Avg/Tot	3.4	-3.9	-1.9		331.2	356.0				
2002										
JAN	-4.7	-9.3	-7.4			63.3				
FEB	-3.7	-10.4	-9.3			40.1	105.6	30.0	127.6	41.0
MAR	-4.7	-14.2	-10.7			76.7	117.2	35.2	139.2	45.8
APR	1.6	-6.9	-5.0			52.4	120.4	42.6	148.4	56.0
MAY	5.9	-1.8	0.5		70.7	34.9				
JUNE	12.8	4.5	8.0		60.7					
JULY	14.3	6.1	7.0		38.2					
AUG	15.4	6.7	8.6		5.7					
SEPT	8.6	2.4	4.0		97.0					
OCT	5.9	-0.9	-0.7		45.8					
NOV	0.3	-3.0	-2.1		2.2	14.6				
DEC	-4.0	-7.4	-6.4			21.1				
Avg/Tot	4.0	-2.9	-1.1		320.3	303.1				

PERIOD	TEMPERATURE -C MAX.	MIN.	AVG.	HEATING DEG. DAYS	PRECIPITATION RAIN MM.	SNOW CM.	SNOW PACK LU LAKE SITE SNOW PACK CM.	LU LAKE SITE WATER EQUIV CM	EQUITY SITE SNOW PACK CM.	EQUITY SITE WATER EQUIV CM
2003										
JAN	-2.9	-7.9	-6.4		8.5	52.5				
FEB	-1.4	-10.2	-7.7			26.6	53.0	12.2	81.2	19.0
MAR	-3.1	-10.3	-6.3			23.6	61.6	16.2	94.0	25.8
APR	3.4	-4.4	-1.2		12.2	13.8	46.4	14.4	77.6	24.2
MAY	8.1	-0.5	2.5		22.3	2.5				
JUNE	13.9	5.4	8.2		69.1					
JULY	16.2	6.2	9.9		64.1					
AUG	15.1	6.3	8.3		50.3					
SEPT	10.0	2.9	3.5		77.7	3.4				
OCT	6.1	-0.6	0.6		75.9	30.7				
NOV	-3.3	-10.3	-7.7			71.0				
DEC	-4.3	-10.3	-7.8			13.5				
Avg/Tot	4.8	-2.8	-0.3		380.1	237.6				
2004										
JAN	-9.1	-14.7	-12.5			53.5				
FEB	-2.4	-7.9	-5.8			33.7	69.6	16.8	86.2	21.8
MAR	0.6	-7.1	-4.3		1.4	35.9	83.6	22.2	96.6	28.2
APR	6.7	-2.7	-0.3		25.8	6.5	53.6	16.0	66.8	23.6
MAY	11.1	1.5	4.4		43.0	14.5				
JUNE	17.5	6.4	10.9		82.8					
JULY	16.6	7.6	10.9		83.2					
AUG	17.2	7.2	10.2		58.8					
SEPT	7.9	1.4	2.5		71.4	9.5				
OCT	4.0	-2.0	-0.7		47.3	32.0				
NOV	-1.6	-6.8	-4.7		15.4	88.5				
DEC	-4.7	-8.7	-7.0		7.7	71.2				
Avg/Tot	5.3	-2.2	0.3		436.8	345.3				
2005										
JAN	-7.1	-13.3	-11.1		18.7	30.6				
FEB	-1.5	-9.5	-7.9			36.4	84.0	21.6	101.4	30.4
MAR	0.7	-6.8	-4.6		9.8	29.5	85.4	21.4	111.6	31.4
APR	6.0	-2.9	-0.4		6.6	49.6	76.4	23.8	92.8	31.6
MAY	12.8	2.6	6.0		28.5					
JUNE	14.2	5.9	8.2		63.1					
JULY	13.9	6.0	8.1		121.1					
AUG	15.3	6.4	8.9		55.8					
SEPT	9.8	2.2	3.5		43.9	4.0				
OCT	4.0	-1.4	0.0		34.1	31.3				
NOV	-1.3	-5.3	-4.0		9.0	32.5				
DEC	-3.4	-7.8	-5.9		1.9	36.1				
Avg/Tot	5.3	-2.0	0.1		392.5	250.0				

PERIOD	TEMPERATURE -C MAX.	TEMPERATURE -C MIN.	TEMPERATURE -C AVG.	HEATING DEG. DAYS	PRECIPITATION RAIN MM.	PRECIPITATION SNOW CM.	SNOW PACK LU LAKE SITE SNOW PACK CM.	SNOW PACK LU LAKE SITE WATER EQUIV CM	SNOW PACK EQUITY SITE SNOW PACK CM.	SNOW PACK EQUITY SITE WATER EQUIV CM
2006										
JAN	-2.8	-8.5	-5.6			59.8				
FEB	-3.8	-13.4	-8.6			28.0	54.4	13.4	91.8	26.4
MAR	-2.1	-12.1	-7.1			35.9	74.8	19.6	112.6	31.4
APR	5.0	-4.9	0.0			6.9	49.4	16.8	85.2	28.8
MAY	10.6	-0.1	5.3		42.5	2.4				
JUNE	16.6	4.8	10.7		46.9					
JULY	17.5	6.9	12.2		108.1					
AUG	15.1	4.6	9.9		32.6					
SEPT	13.5	3.0	8.2		55.6	0.5				
OCT	6.6	-2.7	1.7		17.0	18.5				
NOV	-6.9	-14.2	-10.6			124.0				
DEC	-2.6	-8.6	-5.5			79.5				
Avg/Tot	5.6	-3.8	0.9		302.7	355.5				
2007										
JAN	-2.7	-12.0	-7.3			46.5	115.8	35.2	134.5	45.8
FEB	-2.9	-10.2	-6.5		0.6	48.5	138.2	41.2	161.0	54.6
MAR	-0.5	-8.7	-4.6		0.6	50.1	141.8	50.4	168.6	57.2
APR	1.7	-5.8	-2.0		30.3	38.0	137.8	52.8	165.0	69.0
MAY	8.3	-1.2	3.6		14.6	15.0				
JUNE	12.0	3.2	7.6		150.2					
JULY	16.5	7.6	12.1		97.1					
AUG	14.9	5.6	10.3		93.5					
SEPT	10.4	2.2	6.3		29.6					
OCT	3.7	-1.5	1.1		43.7	43.3				
NOV	-1.9	-9.3	-5.6		7.8	79.0				
DEC	-6.2	-13.9	-10.0			74.0				
Avg/Tot	4.4	-3.7	0.4		468.0	394.4				
2008										
JAN	-6.0	-13.3	-9.6			27.2				
FEB	-1.3	-10.6	-5.9			33.5	94.0	24.0	116.0	33.0
MAR	-0.5	-8.9	-4.7			32.4	111.8	29.6	139.5	38.3
APR	1.2	-6.5	-2.7			11.6	86.4	24.0	118.6	40.0
MAY	10.0	2.9	6.4		25.9					
JUNE	11.7	4.7	8.2		31.9					
JULY	14.9	6.7	10.8		44.5					
AUG	15.9	7.6	11.7		106.4					
SEPT	12.3	4.0	8.2		39.0					
OCT	3.8	-1.8	1.0		20.9	33.0				
NOV	0.1	-4.6	-2.3		13.7	74.5				
DEC	-7.8	-13.8	-10.8		1.2	41.6				
Avg/Tot	4.5	-2.8	0.9		283.5	253.8				

PERIOD	TEMPERATURE -C MAX.	MIN.	AVG.	HEATING DEG. DAYS	PRECIPITATION RAIN MM.	SNOW CM.	SNOW PACK LU LAKE SITE SNOW PACK CM.	LU LAKE SITE WATER EQUIV CM	EQUITY SITE SNOW PACK CM.	EQUITY SITE WATER EQUIV CM
2009										
JAN	-3.7	-11.3	-7.5			76.0				
FEB	-5.1	-13.9	-9.5			31.2	95.8	27.2	126.0	38.6
MAR	-3.5	-11.2	-7.3			38.1	112.4	33.6	142.0	44.2
APR	2.3	-3.9	-0.8		14.5	41.3	113.2	37.8	142.8	46.2
MAY	7.7	-0.2	3.8		34.2	11.5				
JUNE	14.5	3.4	8.9		37.8					
JULY	20.2	5.9	13.0		82.1					
AUG	17.2	3.6	10.4		21.1					
SEPT	12.0	2.2	7.1		75.1	1.0				
OCT	3.0	-2.4	0.3		36.5	54.2				
NOV	-1.1	-5.9	-3.5		7.0	70.9				
DEC	-6.6	-8.7	-7.6			57.5				
Avg/Tot	4.7	-3.5	0.6		308.3	381.7				
2010										
JAN	-3.2	-6.6	-4.9		4.4	53.4				
FEB	-0.3	-7.8	-4.1			27.7	88.6	24.0	110.6	32.4
MAR	1.7	-5.4	-1.8			11.0	82.8	24.6	105.4	35.0
APR	5.0	-6.3	-0.6		22.8	11.3	67.4	22.2	92.4	34.0
MAY	9.4	-1.3	4.1		44.7	23.5				
JUNE	13.0	2.6	7.8		38.1					
JULY	18.7	6.0	12.3		17.6					
AUG	16.9	6.2	11.6		37.9					
SEPT	10.3	0.6	5.4		123.6					
OCT	6.2	-2.0	2.1		41.2	28.3				
NOV	-2.7	-10.0	-6.3		0.6	63.0				
DEC	-4.3	-12.3	-8.3			45.8				
Avg/Tot	5.9	-3.0	1.4		330.9	264.0				
2011										
JAN	-7.0	-12.3	-9.7		14.5	90.8				
FEB	-6.1	-15.6	-4.1			45.7	98.5	25.8	115.6	33.8
MAR	-2.0	-12.0	-1.8			69.8	108.6	33.2	135.8	42.0
APR	2.7	-10.6	-0.6			84.3	132.6	42.4	152.2	52.4
MAY	7.6	-0.8	4.1		71.1	50.5				
JUNE	12.9	3.3	7.8		71.1					
JULY	12.8	5.1	12.3		113.5					
AUG	15.0	4.1	11.6		24.9					
SEPT	13.4	3.5	5.4		66.2					
OCT	4.8	-2.8	2.1		13.6	9.0				
NOV	-1.4	-10.3	-6.3		3.0	115.5				
DEC	-1.4	-11.5	-8.3			65.7				
Avg/Tot	4.3	-5.0	1.0		377.9	531.3				

PERIOD	TEMPERATURE -C MAX.	MIN.	AVG.	HEATING DEG. DAYS	PRECIPITATION RAIN MM.	SNOW CM.	SNOW PACK LU LAKE SITE SNOW PACK CM.	WATER EQUIV CM	EQUITY SITE SNOW PACK CM.	WATER EQUIV CM
2012										
JAN	-7.6	-15.6	-11.6			69.4				
FEB	-2.3	-10.1	-6.2			74.8	132.6	35.8	160.0	47.0
MAR	-0.2	-9.9	-5.1			27.7	129.4	45.6	148.4	55.6
APR	4.5	-5.7	-0.6		40.7	26.1	108.8	44.0	130.2	55.0
MAY	6.9	-2.4	2.2		10.1	14.0				
JUNE	11.2	3.0	7.1		86.9					
JULY	19.4	7.7	13.5		32.1					
AUG	18.0	5.8	11.9		67.3					
SEPT	15.8	2.3	9.0		18.8					
OCT	3.1	-4.6	-0.8		31.7	72.8				
NOV	-3.1	-9.4	-6.2		3.3	50.2				
DEC	-5.9	-14.2	-10.0			65.0				
Avg/Tot	5.0	-4.4	0.3		290.9	400.0				
2013										
JAN	-1.2	-7.4	-4.3			41.6				
FEB	-0.5	-7.4	-4.0			37.2	82.6	21.0	100.0	27.4
MAR	0.9	-12.6	-5.9			30.3	93.2	27.2	110.6	33.2
APR	3.0	-6.3	-1.7			36.0	91.0	24.8	117.0	39.0
MAY	12.2	0.8	6.5		60.5					
JUNE	15.1	6.0	10.6		111.5					
JULY	18.4	7.0	12.7		39.3					
AUG	18.3	7.9	13.1		109.2					
SEPT	15.2	4.5	9.9		72.9					
OCT	8.3	0.0	4.2		40.3	7.9				
NOV	-1.2	-7.3	-4.3			51.3				
DEC	-2.5	-9.4	-5.9			67.6				
Avg/Tot	7.2	-2.0	2.6		433.7	271.9				
2014										
JAN	0.7	-7.9	-3.6			62.2				
FEB	-7.2	-18.6	-12.9			42.0	85.8	20.6	101.0	27.8
MAR	-4.1	-15.4	-9.7			54.0	107.0	25.6	128.4	33.8
APR	5.0	-4.9	0.1		10.6	31.5	93.6	30.0	116.8	40.4
MAY	10.9	1.3	6.1		50.4	3.7				
JUNE	14.5	3.7	9.1		38.8					
JULY	19.5	7.6	13.5		37.4					
AUG	19.2	7.5	13.4		14.0					
SEPT										
OCT										
NOV										
DEC										
Avg/Tot	7.3	-3.3	2.0		151.2	193.4				

TABLE B-2
EQUITY DIVISION WEATHER RECORDS

SUMMARY OF WEATHER RECORDS

Year	TEMPERATURE -C			PRECIPITATION		
				Rain	Snow	Total
	Max	Min	Average	mm	cm	mm
1982	5.9	-3.5	1.2	255.7	273.2	528.9
1983	6.8	-3.1	1.8	347.2	167.5	514.7
1984	5.6	-3.1	1.2	320.6	221.9	542.5
1985	6.2	-3.4	1.4	232.1	177.4	409.5
1986	6.2	-2.3	1.9	307.5	196.9	504.4
1987	6.5	-1.3	2.6	334.0	193.3	527.3
1988	4.8	-3.2	1.0	259.1	297.2	556.3
1989	6.0	-1.5	2.2	361.9	299.1	661.0
1990	5.7	-2.4	1.6	233.9	355.2	589.1
1991	6.5	-2.4	2.1	301.3	253.9	555.2
1992	6.2	-1.5	2.4	247.9	309.1	557.0
1993	6.4	-1.9	2.2	459.1	161.7	620.8
1994	5.9	-2.5	1.7	381.1	652.9	1034.0
1995	5.8	-3.8	0.7	282.6	378.8	661.4
1996	3.7	-5.7	-1.3	359.4	501.8	861.2
1997	5.6	-3.1	0.9	380.0	385.1	765.1
1998	5.7	-2.9	0.1	312.3	335.3	647.6
1999	4.4	-2.7	-0.8	407.6	387.7	795.3
2000	3.4	-3.5	-1.8	397.4	215.3	612.7
2001	3.4	-3.9	-1.9	331.2	356.0	687.2
2002	4.0	-2.9	-1.1	320.3	303.1	623.4
2003	4.8	-2.8	-0.3	380.1	237.6	617.7
2004	5.3	-2.2	0.3	436.8	345.3	782.1
2005	5.3	-2.0	0.1	392.5	250.0	642.5
2006	5.6	-3.8	0.9	302.7	355.5	658.2
2007	4.4	-3.7	0.4	468.0	394.4	862.4
2008	4.5	-2.8	0.9	283.5	253.8	537.3
2009	4.7	-3.5	0.6	308.3	381.7	690.0
2010	5.9	-3.0	1.4	330.9	264.0	594.9
2011	4.3	-5.0	1.0	377.9	531.3	909.2
2012	5.0	-4.4	0.3	290.9	400.0	690.9
2013	7.2	-2.0	2.6	433.7	271.9	705.6
2014						

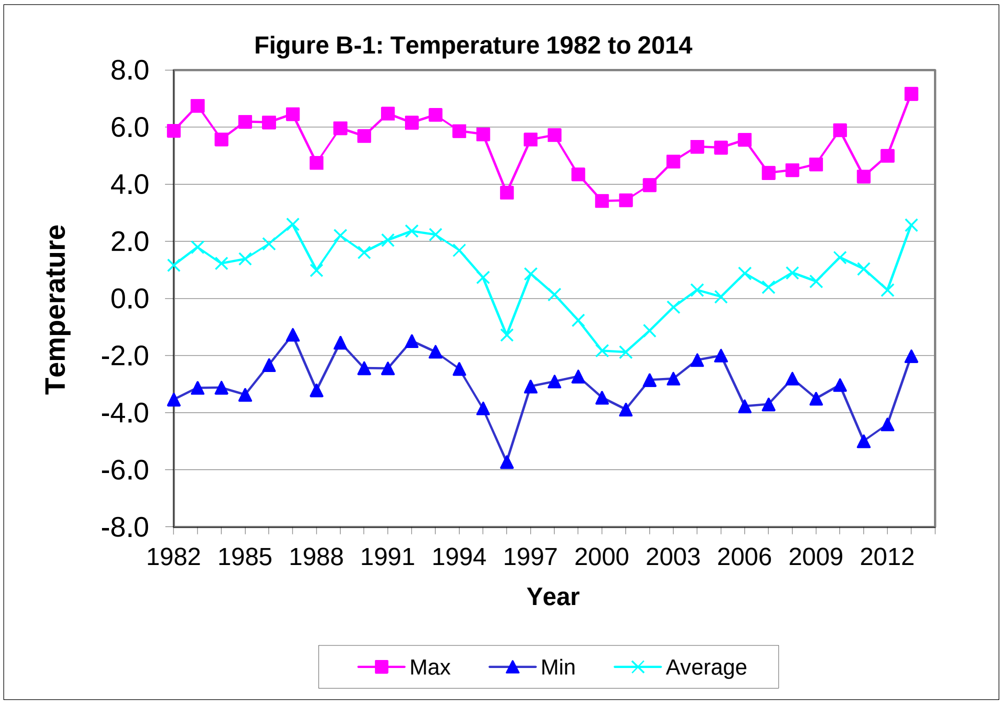


Figure B-1: Temperature 1982 to 2014
Temperature
8.0
6.0
4.0
2.0
0.0
-2.0
-4.0
-6.0
-8.0
1982
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
Year
Max
Min
Average

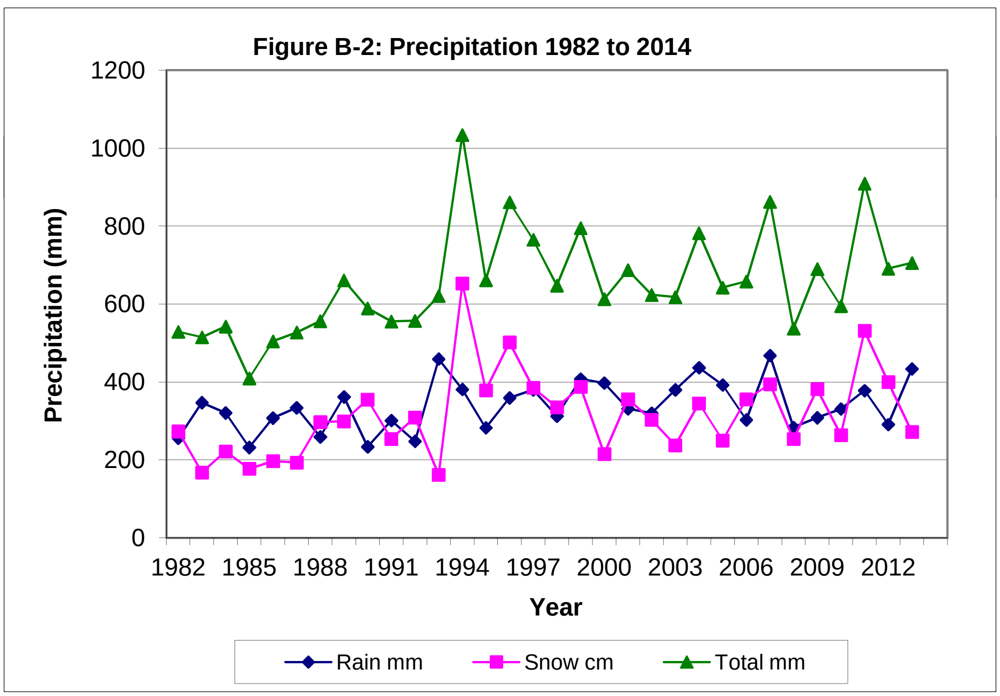


Figure B-2: Precipitation 1982 to 2014
Precipitation (mm)
1200
1000
800
600
400
200
0
1982
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
Year
Rain mm
Snow cm
Total mm

APPENDIX C

Water Balance, Decant Records, Pond Levels, and Pump-Back Records

Tailings Pond Water Balance and Storage Requirements

1. Assumptions				Reference
Undiverted Tailings Pond Catchment Area	=	137	ha	CCL 2002
Average Pond Water Area in 2014	=	122	ha	Site Monitoring Data
Pond Water Elevation August 29, 2014	=	1291.79	m	Site Monitoring Data
Average Annual Direct Precipitation on Pond Surface	=	713	mm	AMEC 2010
Average Annual Catchment Runoff from Pond Catchment Surface	=	440	mm	Klohn Leonoff 1985
Average Annual Evaporation from Pond Surface	=	500	mm	Klohn Leonoff 1985
100-Year Return period Wet Year Direct Precipitation	=	1172	mm	Klohn Leonoff 1985
100- Year Return Period Wet Year Catchment Runoff	=	902	mm	Klohn Leonoff 1985
1000- Year Return Period 96-Hour Storm Direct Precipitation	=	150	mm	Klohn Leonoff 1985
1000- Year Return Period 96- Hour Storm Catchment Runoff	=	150	mm	Klohn Leonoff 1985
Average Annual Seepage (based on average monthly seepage rate of 5587 m^3/month from Dam No.1)	=	67044	m^3	Site Monitoring Data

NET SURPLUS = INPUT-LOSSES

INPUTS= PRECIPITATION+ CATCHMENT RUNOFF

LOSSES = SEEPAGE + EVAPORATION

Notes:

1. Seepage loss estimates do not include losses from Dam No. 2 or the Diversion Dam.
2. Original site hydrology is based on a summary of the precipitation, runoff, and evaporation data used in the design of the tailings facility as described in "Report on the Revised Tailings Disposal Plan and Modifications to Dam Design" (Klohn Leonoff 1985).
3. A review of the site hydrology was performed following the events of 2002 by Clearwater Consultants which was documented in memorandum "CCL-EM-4: Equity Mine – Evaluation of Ditches" (CCL 2002).
4. The site hydrology was further revisited by AMEC in 2010 as part of the "Hydrology Update and Hydraulic Structures Review" (AMEC 2010).

Tailings Pond Water Balance and Storage Requirements

2. Estimated Tailings Pond Elevation in September 2015 Based on Average Conditions

Inputs

Direct Precipitation	=	122 ha x 713 mm	=	869 860 m^3
Catchment Runoff	=	(137 ha - 122 ha) x 440 mm	=	66 000 m^3
		TOTAL INPUTS	**=**	**935 860 m^3**

Losses

Evaporation	=	122 ha x 500 mm	=	610 000 m^3
Seepage Losses			=	67 044 m^3
		TOTAL LOSSES	**=**	**677 044 m^3**

NET SURPLUS = INPUTS - LOSSES	=	**258 816 m^3**
Pond Water Elevation August 29, 2014	=	1291.79 m
Estimated Increase in Pond Level (based on dV/dz = 1 220 000 m^3/m)	=	0.21 m
ESTIMATED POND WATER ELEVATION OCTOBER 2014	**=**	**1292.00 m**

Tailings Pond Water Balance and Storage Requirements

3. Estimated Pond Level in September 2015 Based on Design Flood

Inputs

Direct Precipitation from a 100- Year Return Period				
	=	122 ha x 1172 mm	=	1 429 840 m^3
Excess Catchment Run-off from a 100- Year Return Period				
	=	(137 ha - 122 ha) x 902 mm	=	135 300 m^3
Direct Precipitation from a 1000- Year Return Period 96 Hour Storm				
	=	122 ha x 150 mm	=	183 000 m^3
Catchment Runoff from a 1000- Year Return Period 96 Hour Storm				
	=	(137 ha - 122 ha) x 150 mm	=	22 500 m^3
		TOTAL INPUTS	**=**	**1 770 640 m^3**

Losses

Evaporation	=	122 ha x 500 mm	=	610 000 m^3
Seepage Losses			=	67 044 m^3
		TOTAL LOSSES	**=**	**677 044 m^3**

NET SURPLUS = INPUTS - LOSSES	=	**1 093 596 m^3**
Pond Water Elevation August 29, 2014	=	1291.79 m
Estimated Increase in Pond Level (based on dV/dz = 1 220 000 m^3/m)	=	0.90 m
ESTIMATED POND WATER ELEVATION OCTOBER 2014	**=**	**1292.69 m**

Table C-1. Tailings Pond Decant Records

TAILINGS POND DECANT - March/April 1997

Date	Time	Hours Since Last Reading	Decant Rate (USGPM)	Decant Rate (m^3/min)	Decant - Period (m^3)	Total Decant (m^3)	Level reading (cm)	Comments
26-Mar-97	11:45 AM	0.00	2065	7.822			set mark	Started decant
27-Mar-97	11:30 AM	23.75	2065	7.822	11146.4	11146.4	n/c	Water level fluctuates
31-Mar-97	10:45 AM	95.25	2065	7.822	44702.7	55849.1	-4.8	Sample
02-Apr-97	11:15 AM	48.50	2065	7.822	22762.0	78611.1	-7.0	
04-Apr-97	3:50 PM	52.58	2065	7.822	24676.8	103287.9	-9.8	Small vortex - Plywood overtop
07-Apr-97	11:50 AM	68.00	2065	7.822	31913.8	135201.7	-13.2	Sample
08-Apr-97	1:15 PM	25.42	2065	7.822	11930.1	147131.8	-14.3	
10-Apr-97	9:45 AM	44.50	2065	7.822	20884.7	168016.6	-16.5	
11-Apr-97	10:30 AM	24.75	2065	7.822	11615.7	179632.2	-18.1	
12-Apr-97	4:30 PM	30.00	2065	7.822	14079.6	193711.8	-18.8	Shut off decant @ 4:30 PM
14-Apr-97								Bioassay sample from Div. Pond
Total		412.75			193711.8			

TAILINGS POND DECANT - October/November 1997

Date	Time	Hours Since Last Reading	Decant Rate (USGPM)	Decant Rate (m^3/min)	Decant - Period (m^3)	Total Decant (m^3)	Level reading (cm)	Comments
28-Oct-97	1:40 PM	0.00	2065	7.822			set mark	Started decant - 1292.37
03-Nov-97	9:40 AM	140.00	2065	7.822	65704.8	65704.8	-5.8	Sampled decant, 1292.31
06-Nov-97	10:00 AM	72.33	2065	7.822	33945.9	99650.7	-9.5	1292.275
10-Nov-97	9:30 AM	95.50	2065	7.822	44820.1	144470.8		Sampled decant
14-Nov-97	2:00 PM	100.50	2065	7.822	47166.7	191637.4	-18.5	Ice cover - 1292.185
17-Nov-97	9:30 AM	67.50	2065	7.822	31679.1	223316.5	-22.0	Sampled decant - 1292.15
24-Nov-97	10:30 AM	169.00	2065	7.822	79315.1	302631.6	-31.0	Shut off decant @ 10:30 AM
								Level 1292.06
								Bioassay from Div. Pond - Foxy
Total		644.83			302631.6			

TAILINGS POND DECANT - September 1998

Date	Time	Hours Since Last Reading	Decant Rate (USGPM)	Decant Rate (m^3/min)	Decant - Period (m^3)	Total Decant (m^3)	Level reading (cm)	Comments
17-Sep-98	11:50 AM	0.00	2065	7.822			set mark	Started decant - 1292.14
21-Sep-98	10:00 AM	93.80	2065	7.822	44022.2	44022.2	-5.0	Level 1292.09, Decant + Evap
24-Sep-98	8:00 AM	70.00	2065	7.822	32852.4	76874.6	-9.5	Level 1292.045, Decant + Evap
25-Sep-98	3:30 PM	31.50	2065	7.822	14783.6	91658.2	-16.0	Level 1291.98, Decant + Evap
								Shut Off - 1291.98
Total		195.30			91658.2			

TAILINGS POND DECANT - April 1999

Date	Time	Hours Since Last Reading	Decant Rate (USGPM)	Decant Rate (m^3/min)	Decant - Period (m^3)	Total Decant (m^3)	Level reading (cm)	Comments
05-Apr-99	1:20 PM	0.0	2065	7.822				Start decant - Ice Cover
06-Apr-99	9:20 AM	20.0	2065	7.822	9386.4	9386.4	set mark	
08-Apr-99	11:00 AM	49.3	2065	7.822	23137.5	32523.9	-0.5	
12-Apr-99	9:20 AM	94.3	2065	7.822	44256.9	76780.8	-6.4	Sampled decant & Div Pond
14-Apr-99	4:00 PM	54.6	2065	7.822	25624.9	102405.6	-9.5	Shut off decant
15-Apr-99								Bioassay sample from Div Pond

TAILINGS POND DECANT - August 1999

Date	Time	Hours Since Last Reading	Decant Rate (USGPM)	Decant Rate (m^3/min)	Decant - Period (m^3)	Total Decant (m^3)	Level reading (cm)	Comments
25-Aug-99	10:00 AM	0.0	2065	7.822				Start decant 1292.18 m
30-Aug-99	10:30 AM	120.5	2065	7.822	56553.1	56553.1	5	Elev 1292.13 m
03-Sep-99	9:00 AM	94.5	2065	7.822	44350.7	100903.8	11	Elev 1292.07 m
07-Sep-99	10:00 AM	97.0	2065	7.822	45524.0	146427.8	14.2	Elev 1292.04 m
10-Sep-99	3:30 PM	77.5	2065	7.822	36372.3	182800.1	18.3	Stopped decant 1292.00 m

TAILINGS POND DECANT - July 2000

Date	Time	Hours Since Last Reading	Decant Rate (USGPM)	Decant Rate (m^3/min)	Decant - Period (m^3)	Total Decant (m^3)	Level reading (m)	Comments
28-Jul-00	1:15 PM							
04-Aug-00	3:15 PM	170.0	2065	7.822	79784.4	79784.4	1292.030	Stopped decant on August 4th

TAILINGS POND DECANT - January 31, 2001

Date	Time	Hours Since Last Reading	Decant Rate (USGPM)	Decant Rate (m^3/min)	Decant - Period (m^3)	Total Decant (m^3)	Level reading (m)	Comments
31-Jan-01	11:30 AM						N/A	Started - level difficult w/ ice
02-Feb-01	10:30 AM	47.0	2065	7.822	22058.0	22058.0		
05-Feb-01	10:30 AM	72.0	2065	7.822	33791.0	55849.1		
09-Feb-01	1:20 PM	98.7	2065	7.822	46307.8	102156.9		Stopped decant (10 cm drop)

Table C-1. Tailings Pond Decant Records

TAILINGS POND DECANT - August 29, 2001

Date	Time	Hours Since Last Reading	Decant Rate (USGPM)	Decant Rate (m^3/min)	Decant - Period (m^3)	Total Decant (m^3)	Level reading (m)	Comments
29-Aug-01	11:00 AM						1292.19	Started - level off new gauge
04-Sep-01	10:00 AM	143.0	2065	7.822	67112.8	67112.8	1292.12	
07-Sep-01	10:00 AM	72.0	2065	7.822	33791.0	100903.8	1292.08	
10-Sep-01	10:00 AM	72.0	2065	7.822	33791.0	134694.8	1292.04	
11-Sep-01	8:30 AM	22.5	2065	7.822	10559.7	145254.5	1292.025	Stopped decant.

TAILINGS POND DECANT - March 26, 2002

Date	Time	Hours Since Last Reading	Decant Rate (USGPM)	Decant Rate (m^3/min)	Decant - Period (m^3)	Total Decant (m^3)	Level reading (m)	Comments
26-Mar-02	1:00 PM							Started - could not determine level
29-Mar-02	10:00 AM	69.0	2065	7.822	32383.1	32383.1		
01-Apr-02	10:00 AM	72.0	2065	7.822	33791.0	66174.1		
04-Apr-02	11:15 AM	73.25	2065	7.822	34377.7	100551.8		Stopped decant.

TAILINGS POND to MAIN ZONE (pump/syphon) - Sept 20, 2002

Date	Time	Hours Since Last Reading	Decant Rate (USGPM)	Decant Rate (m^3/min)	Decant - Period (m^3)	Total Decant (m^3)	Level reading (m)	Comments
20-Sep-02							1292.395	Combination of syphon and
07-Oct-02							1292.280	47 HP pump used to move
21-Oct-02							1292.185	water - syphon would only last
05-Nov-02							1292.040	about 6 hours
15-Nov-02							1291.950	
						542900		

TAILINGS POND Decant to Diversion Pond (decant) 2003

Date	Time	Net Running Time (hrs)	Decant Rate (USGPM)	Decant Rate (m^3/min)	Decant - Period (m^3)	Total Decant (m^3)	Level reading (m)	Comments
21-Aug-03 to 29-Sep-03		17.25	2065	7.822	8095.77	8095.77	1292.105	Decant for short durations to add water for sludge removal.

TAILINGS POND Decant to Main Zone Pit (47-HP pump) 2003

Date	Time	Net Running Time (hrs)	Decant Rate (USGPM)	Decant Rate (m^3/min)	Decant - Period (m^3)	Total Decant (m^3)	Level reading (m)	Comments
21-Oct-03		816	1270	4.81	235497.6	235497.6	1292.000	See Note for explanation of flow
24-Nov-03								calculations.

Note: The above decant rate was calculated based on the following criteria:

Total Pumping Time	Pond surface area (m^2)	Measured drop in pond elev. (m)	Effective Precipitation (m)	Net drop in Pond elev. Incl. precip. (m)	Net Volume
816 hours	1,220,000	0.14	0.0534	0.1934	235948

TAILINGS POND Decant to Diversion Pond (decant) 2004

Date	Time	Net Running Time (hrs)	Decant Rate (USGPM)	Decant Rate (m^3/min)	Decant - Period (m^3)	Total Decant (m^3)	Level reading (m)	Comments
20-Aug-04		10.5	2065	7.822	4927.86	4927.86	1292.110	
23-Aug-04 to 26-Aug-04		52	2065	7.822	24404.64	29332.5	1292.040	
30-Sep-04	8:10 AM - 3:45	7.5	2065	7.822	3519.9	32852.4	1292.085	
07-Oct-04	8:30 AM - 12:45	4.25	2065	7.822	1994.61	34847.0	1292.085	
08-Oct-04	10:30 AM - 3:55	5.5	2065	7.822	2581.26	37428.3	1292.085	

TAILINGS POND Decant to Main Zone Pit (47-HP pump) 2004

Date	Time	Net Running Time (hrs)	Decant Rate (USGPM)	Decant Rate (m^3/min)	Decant - Period (m^3)	Total Decant (m^3)	Level reading (m)	Comments
04-Nov-04	11:00 AM	790.25	1270	4.81	228066.15	265494.4	1292.020	See Note for explanation of flow
07-Dec-04	9:15 AM							calculations.

Note: The above decant rate was calculated based on the following criteria:

Total Pumping Time	Pond surface area (m^2)	Measured drop in pond elev. (m)	Effective Precipitation (m)	Net drop in Pond elev. Incl. precip. (m)	Net Volume
	1,220,000	0.14		0.14	170800

Table C-1. Tailings Pond Decant Records

TAILINGS POND Decant to Diversion Pond (decant) 2005

Date	Time	Net Running Time	Decant Rate		Decant - Period	Total Decant	Level reading	Comments
		(hrs)	(USGPM)	(m^3/min)	(m^3)	(m^3)	(m)	
23-Aug-05	1:30 PM	0.5	2065	7.822	234.7	234.7	1292.210	
25-Aug-05	10:30 AM	0.25	2065	7.822	117.3	352.0	1292.200	
26-Aug-05	9:20 AM & 1:00	0.33	2065	7.822	154.9	506.9	1292.200	
29-Aug-05	8:20 AM & 1:00	0.33	2065	7.822	154.9	661.7	1292.200	
30-Aug-05	9:30 AM & 1:00	0.33	2065	7.822	154.9	816.6	1292.200	
31-Aug-05	9:30 AM & 1:00	0.33	2065	7.822	154.9	971.5	1292.200	
Sept. 1 -19	Various times	4.0	2065	7.822	1877.3	2848.8	1292.170	

TAILINGS POND Decant to Main Zone Pit (47-HP pump) 2005

Start		Net Running Time	Decant Rate		Decant - Period	Total Decant	Level reading	Comments
Date	Time	(hrs)	(USGPM)	(m^3/min)	(m^3)	(m^3)	(m)	
25-Oct-05	1:30 PM	140.1	1270	4.81	40421	43270	1292.220	
31-Oct-05	9:30 AM	52.1	1270	4.81	15036	58306	1292.195	
Total		192.2	1270	4.81	55457			

TAILINGS POND Decant to Main Zone Pit (88-HP pump) 2005

Start		Net Running Time	Decant Rate		Decant - Period	Total Decant	Level reading	Comments
Date	Time	(hrs)	(USGPM)	(m^3/min)	(m^3)	(m^3)	(m)	
02-Nov-05	1:30 PM	691.5	1537	5.82	241554	299860	1292.010	

TAILINGS POND Decant to Main Zone Pit (47-HP pump) 2006

Start		Net Running Time	Decant Rate		Decant - Period	Total Decant	Level reading	Comments
Date	Time	(hrs)	(USGPM)	(m^3/min)	(m^3)	(m^3)	(m)	
09-Jun-06	9:45 AM	334.6	1270	4.81	96551	96551	1292.065	

TAILINGS POND Decant to Diversion Pond (decant) 2006

Date	Time	Net Running Time	Decant Rate		Decant - Period	Total Decant	Level reading	Comments
		(hrs)	(USGPM)	(m^3/min)	(m^3)	(m^3)	(m)	
July 2006	Various times	1.0	2065	7.822	469.3	469.3	1291.980	

TAILINGS POND Decant to Main Zone Pit (88 HP pump) 2007

Start		Net Running Time	Decant Rate		Decant - Period	Total Decant	Level reading	Comments
Date	Time	(hrs)	(USGPM)	(m^3/min)	(m^3)	(m^3)	(m)	
15-May-07	11:00 AM	3.0	200	0.76	136	136	1292.420	
15-May-07	2:00 PM	82.0	1537	5.82	28644	28780	1292.420	
18-May-07	midnight	312.0	1537	5.82	108987	137768	1292.420	
01-Jun-07	midnight	264.0	1538	5.83	92280	230048	1292.420	
12-Jun-07	midnight	325.0	1538	5.83	113602	343650	1292.350	
25-Jun-07	1:00 PM	131.0	1538	5.83	45790	389440	1292.270	
30-Jun-07	midnight	202.5	1538	5.83	70783	460223	1292.270	
03-Oct-07	noon	624.0	1538	5.83	218116	678340	1292.180	
01-Nov-07	midnight	138.0	1538	5.83	48237	726577	1292.040	
07-Nov-07	6:00 PM	208.5	1538	5.83	72880	799457	1292.020	

TAILINGS POND Decant to Main Zone Pit 2008

Note: Sala pump used for tailings pond decant

Start		Net Running Time	Decant Rate		Decant - Period	Total Decant	Level reading	Comments
Date	Time	(hrs)	(USGPM)	(m^3/min)	(m^3)	(m^3)	(m)	
28-Aug-08	11:40	694.8	1196	4.53	188880	188880	1291.96	

TAILINGS POND Decant to Main Zone Pit 2009

Start		Net Running Time	Decant Rate		Decant - Period	Total Decant	Level reading	Comments
Date	Time	(hrs)	(USGPM)	(m^3/min)	(m^3)	(m^3)	(m)	
26-May-09	11:35	887	1270	4.81	256014	256014	1292.11	

TAILINGS POND Decant to Main Zone Pit 2010

Start		Net Running Time	Decant Rate		Decant - Period	Total Decant	Level reading	Comments
Date	Time	(hrs)	(USGPM)	(m^3/min)	(m^3)	(m^3)	(m)	
25-May-10	11:25	157	1270	4.81	45172	45172	1292.30	
01-Jun-10	midnight	712	1270	4.81	205512	250684	1292.05	

TAILINGS POND Decant to Main Zone Pit 2011

Start		Net Running Time	Decant Rate		Decant - Period	Total Decant	Level reading	Comments
Date	Time	(hrs)	(USGPM)	(m^3/min)	(m^3)	(m^3)	(m)	
25-May-11	14:00	22	1270	4.81	6350	6350		
27-May-11	10:00	110	1538	5.83	38450	44800		
01-Jun-11	midnight	720	1538	5.83	251673	296473		
		658	1538	5.83	230001	526474		
		86	1538	5.83	30061	556535		
		373	1538	5.83	130380	686915	1291.98	

Table C-1. Tailings Pond Decant Records

TAILINGS POND Decant to Main Zone Pit 2012

Start		Net Running Time	Decant Rate		Decant - Period	Total Decant	start	Comments
Date	Time	(hrs)	(USGPM)	(m^3/min)	(m^3)	(m^3)	(m)	
24-Apr-12	11:15	157	1100	5.83	39188			
01-May-12	midnight	744	1100	5.83	186000	225188	1292.17	
01-Jun-12	midnight	720	1100	5.83	180000	405188	1292.15	
01-Jul-12	midnight	85	1100		21250	426438		
04-Jul-12	3:00 PM	321	1538		112204	538642	1291.99	
					0	538642		

TAILINGS POND Decant to Main Zone Pit 2013

Start		Net Running Time	Decant Rate		Decant - Period	Total Decant	start	Comments
Date	Time	(hrs)	(USGPM)	(m^3/min)	(m^3)	(m^3)	(m)	
09-May-13	2:00 PM	538	1538	5.83	188055		1292.06	
01-Jun-13	midnight	82.5	1538	5.83	28838	216893	1291.97	

TAILINGS POND Decant to Main Zone Pit 2014

Start		Net Running Time	Decant Rate		Decant - Period	Total Decant	start	Comments
Date	Time	(hrs)	(USGPM)	(m^3/min)	(m^3)	(m^3)	(m)	
12-May-14	1:50 PM	466	1198	5.83	126879			
01-Jun-13	midnight	720	1198	5.83	196036	322915		
01-Jul-14	midnight	206.75	1198	5.83	56292	379208	1291.96	

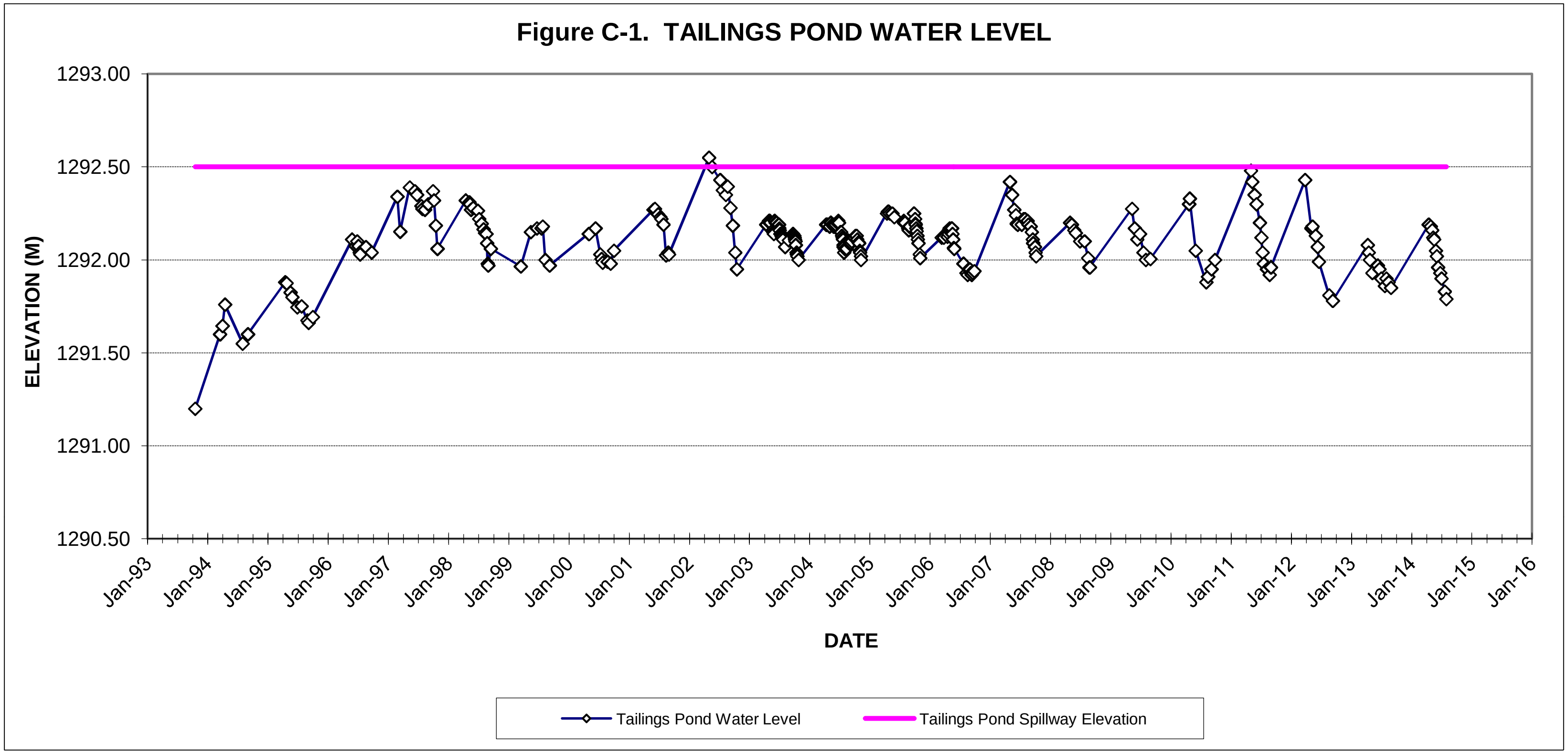
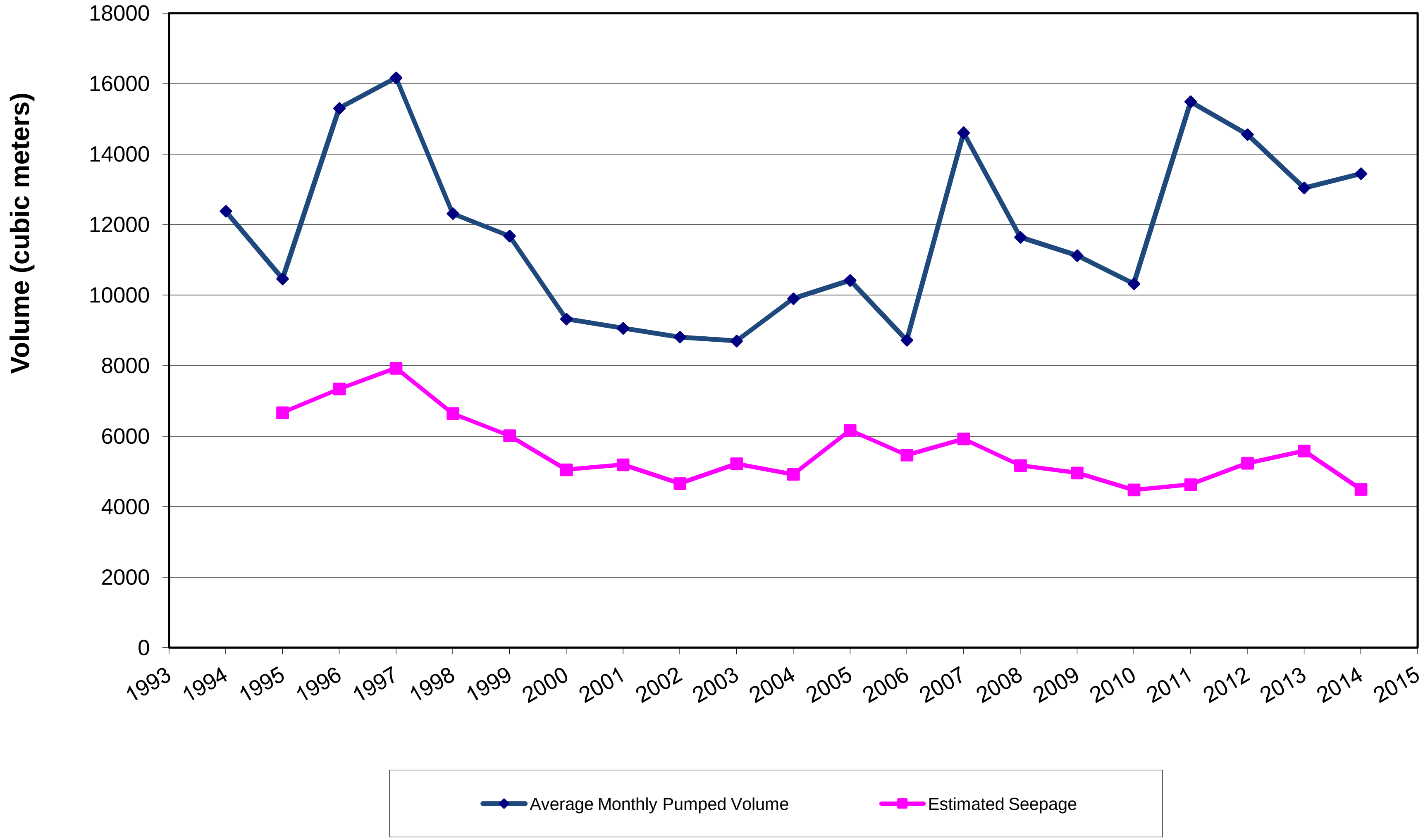


Figure C-1. TAILINGS POND WATER LEVEL
1293.00
1292.50
1292.00
1291.50
1291.00
1290.50
ELEVATION (M)
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
DATE
Tailings Pond Water Level
Tailings Pond Spillway Elevation

Table C-2. No. 1 Dam Seepage Pump-back Records

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Average
	M3/MONTH	M3/MONTH	M3/MONTH	M3/MONTH	M3/MONTH	M3/MONTH	M3/MONTH	M3/MONTH	M3/MONTH	M3/MONTH	M3/MONTH	M3/MONTH	M3/MONTH	M3/MONTH	M3/MONTH	M3/MONTH	M3/MONTH	M3/MONTH	M3/MONTH	M3/MONTH	M3/MONTH	M3/MONTH
JAN		6341	7411	8127	6727	5911	5650	5291	4900	5114	4746	6334	5141	7896	3577	5250	3934	5018	5100	6286	4455	5660
FEB		7834	6348	7350	6139	5464	4627	5223	4645	4943	4319	5291	5734	3893	6404	4296	4364	4473	5209	5475	4439	5323
MAR		5830	8270	8318	7070	6664	4870	5059	4436	5598	5693	6880	5523	5986	5532	5332	5134	4398	5386	4984	4589	5778
APR		13200	19438	16611	11723	12645	7966	7627	6745	10825	11964	15816	5807	7802	6811	5877	10112	4425	9298	8993	6975	10033
MAY	37160	41591	37875	51252	55647	33148	20952	18418	9239	17693	26427	26882	25902	29430	42234	24152	38966	51252	30486	48080	51750	34069
JUN	11600	8939	19977	33286	9818	23655	19859	25027	29827	9055	12446	10064	16180	51484	21641	42834	15591	55091	60428	31153	19298	25783
JUL	9893	7704	14257	10186	10206	11764	9391	10890	10745	11309	9155	6646	7459	26936	12187	13900	5941	23288	25079	11838	11518	12520
AUG	8482	9130	11373	9143	8196	13131	5491	5964	5584	5018	6418	10500	6730	11336	9324	5059	5564	9273	6443	8652	4575	7845
SEP	6777	6020	21075	12777	6855	9155	7173	6146	8305	9000	11491	7193	5980	5948	9831	5850	10684	7424	4234	8887		8633
OCT	10636	5959	18927	19102	10464	7255	9864	6700	7602	12727	9182	13896	6730	11164	6736	6273	10066	8018	7598	10343		9927
NOV	7950	6961	9753	9509	8264	5741	9682	6436	7480	7098	8927	9150	6171	7089	6866	8782	8134	6198	7943	5311		7658
DEC	6573	6096	8952	8361	6675	5600	6400	5991	6252	6050	8066	6409	7316	6348	8591	5905	5414	7028	7543	6539		6818
AVG/TOT	99071	125605	183656	194022	147784	140133	111925	108772	105760	104430	118834	125060	104672	175312	139734	133510	123903	185885	174748	156542	107598	140046
Average Monthly (m^3)	12384	10467	15305	16169	12315	11678	9327	9064	8813	8702	9903	10422	8723	14609	11644	11126	10325	15490	14562	13045	13450	11757
Estimated Seepage (m^3)		6668	7343	7932	6645	6013	5049	5191	4660	5218	4919	6168	5466	5925	5171	4959	4477	4630	5232	5582	4494	5587

Figure C-2. Pump-back Records and Estimated Seepage from No. 1 Dam

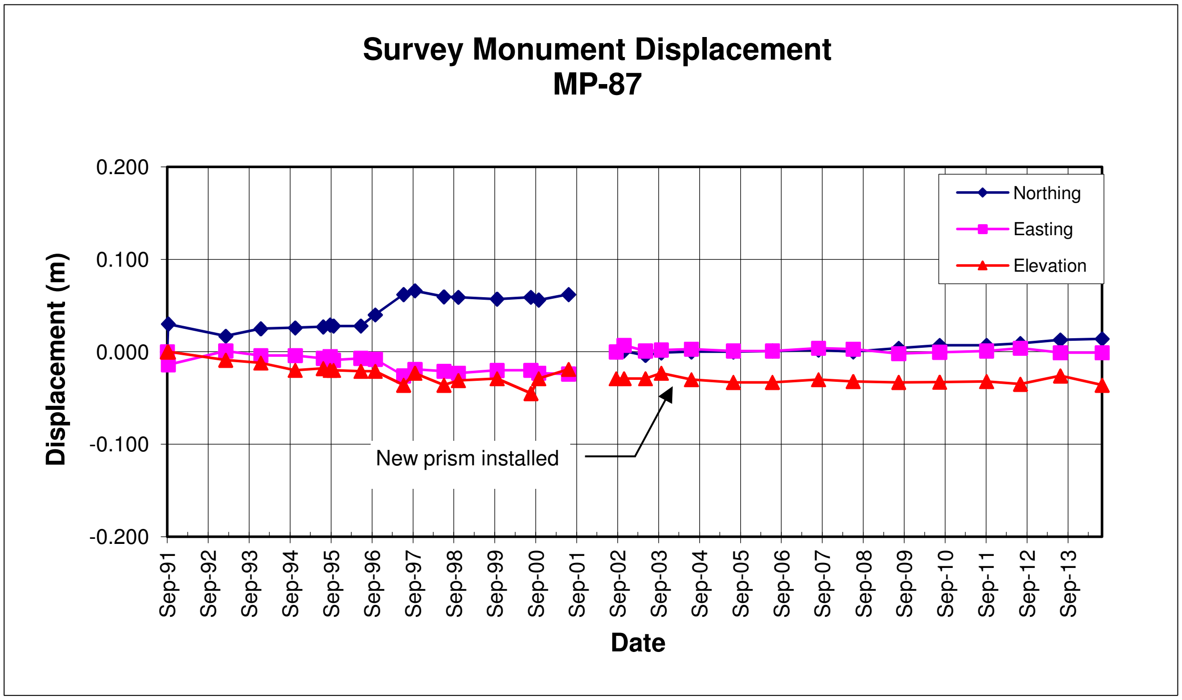


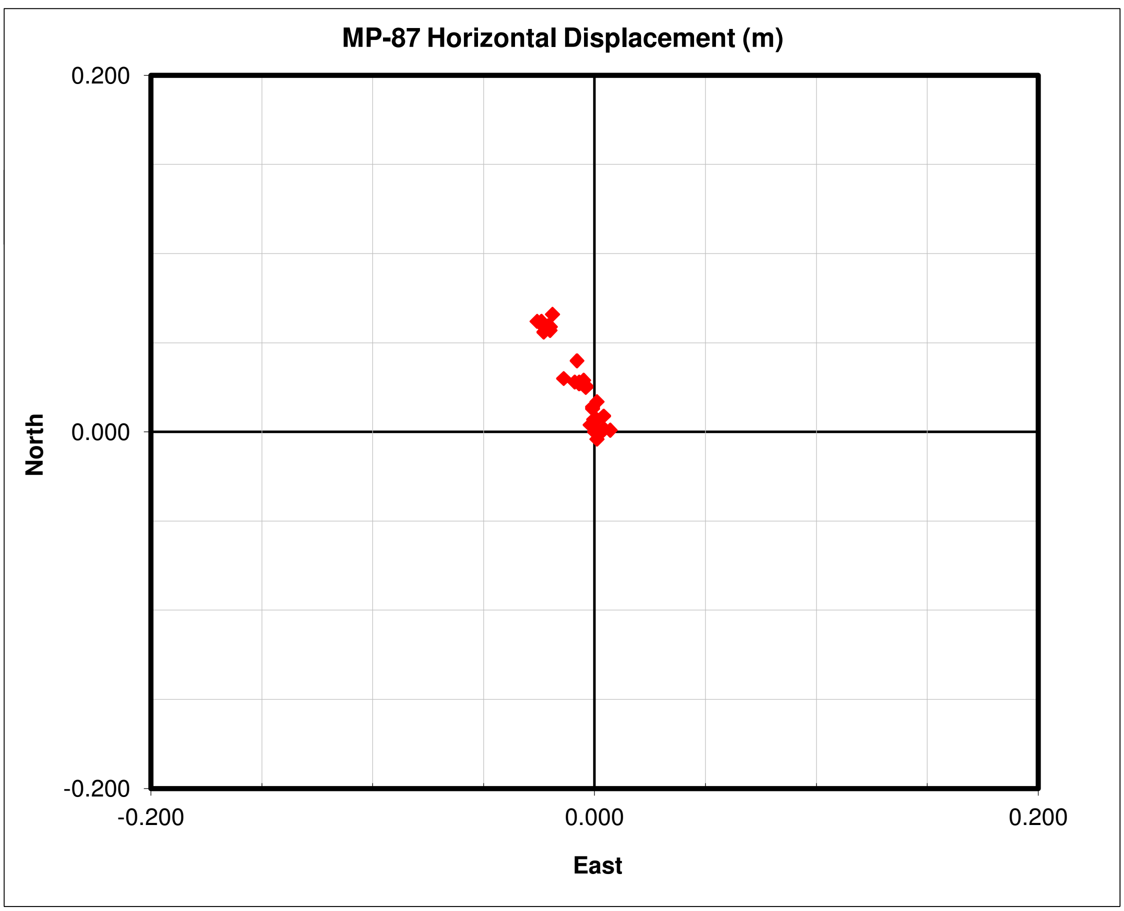
APPENDIX D

Tailings Impoundment Monitoring Data

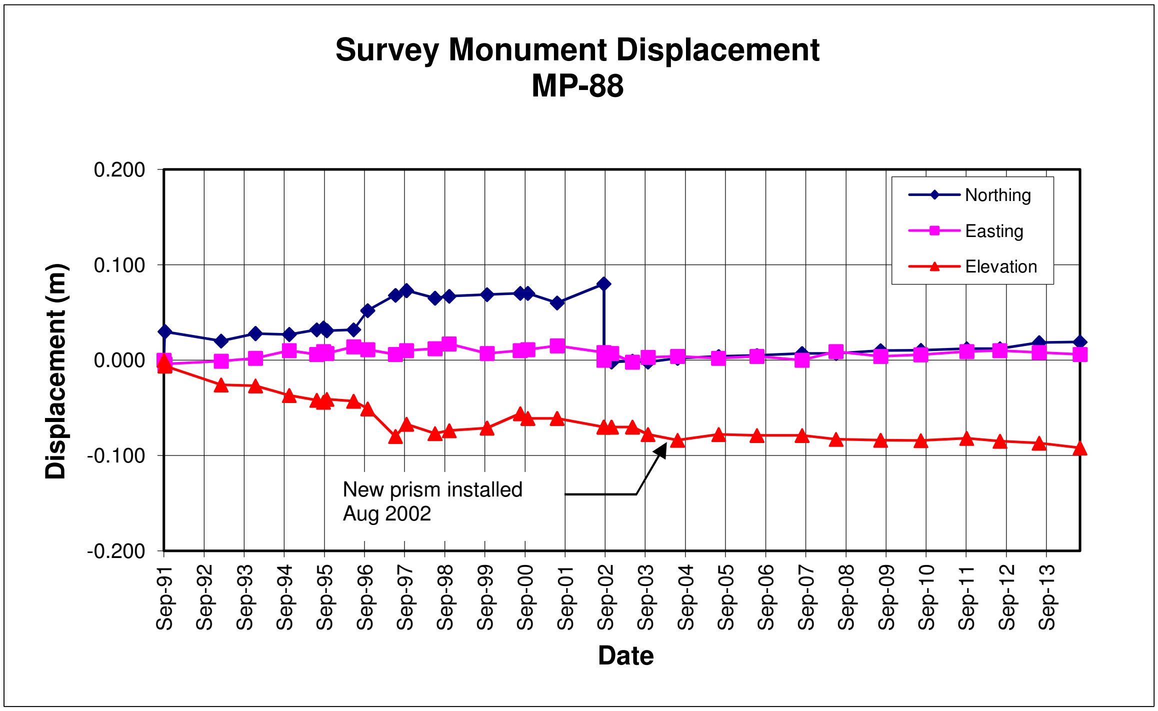
Dam No. 1 (MP- 87 to MP-90)

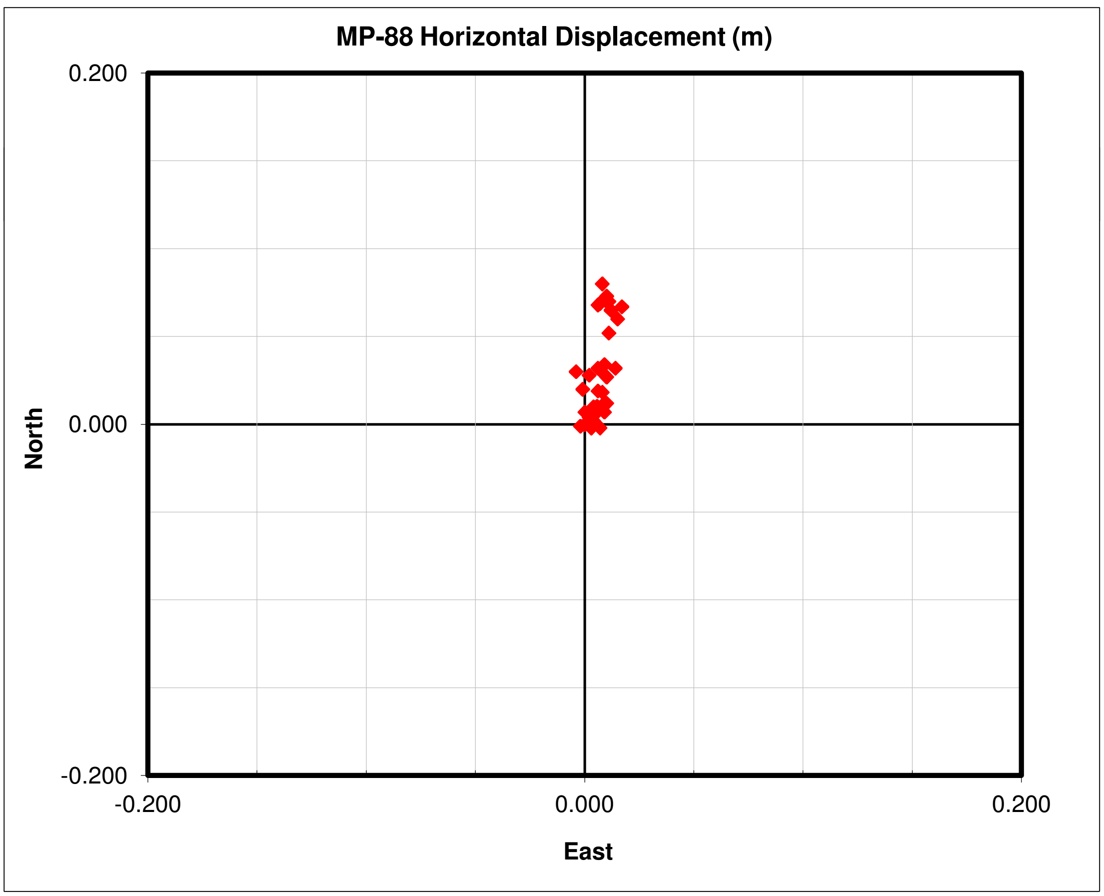
Appendix D

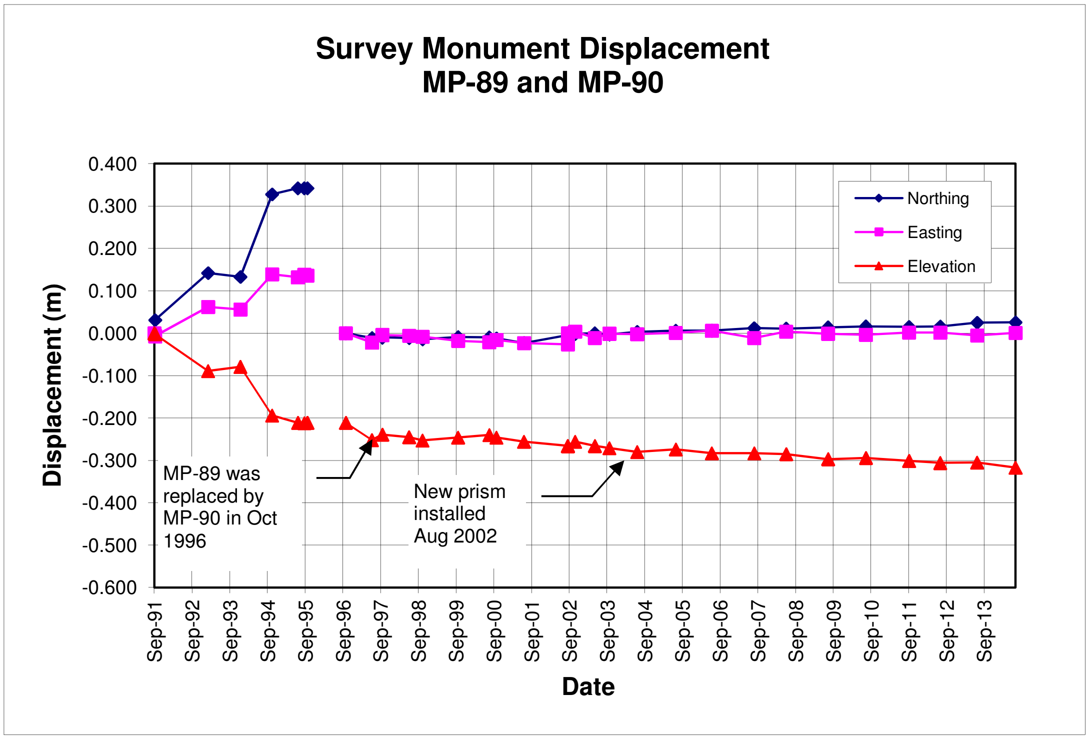

Survey Monument Displacement
MP-87
Displacement (m)
0.200
0.100
0.000
-0.100
-0.200
Northing
Easting
Elevation
New prism installed
Sep-91
Sep-92
Sep-93
Sep-94
Sep-95
Sep-96
Sep-97
Sep-98
Sep-99
Sep-00
Sep-01
Sep-02
Sep-03
Sep-04
Sep-05
Sep-06
Sep-07
Sep-08
Sep-09
Sep-10
Sep-11
Sep-12
Sep-13
Date

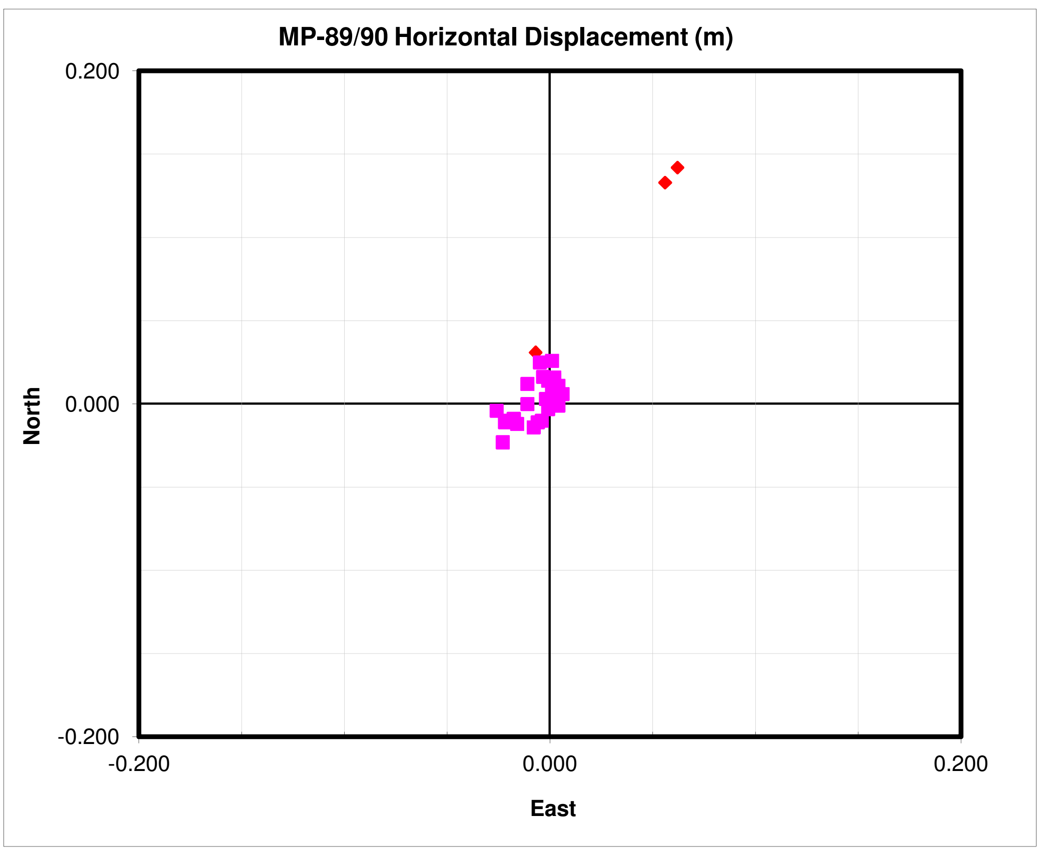

MP-87 Horizontal Displacement (m)
0.200
0.000
-0.200
North
-0.200
0.000
0.200
East

Appendix D

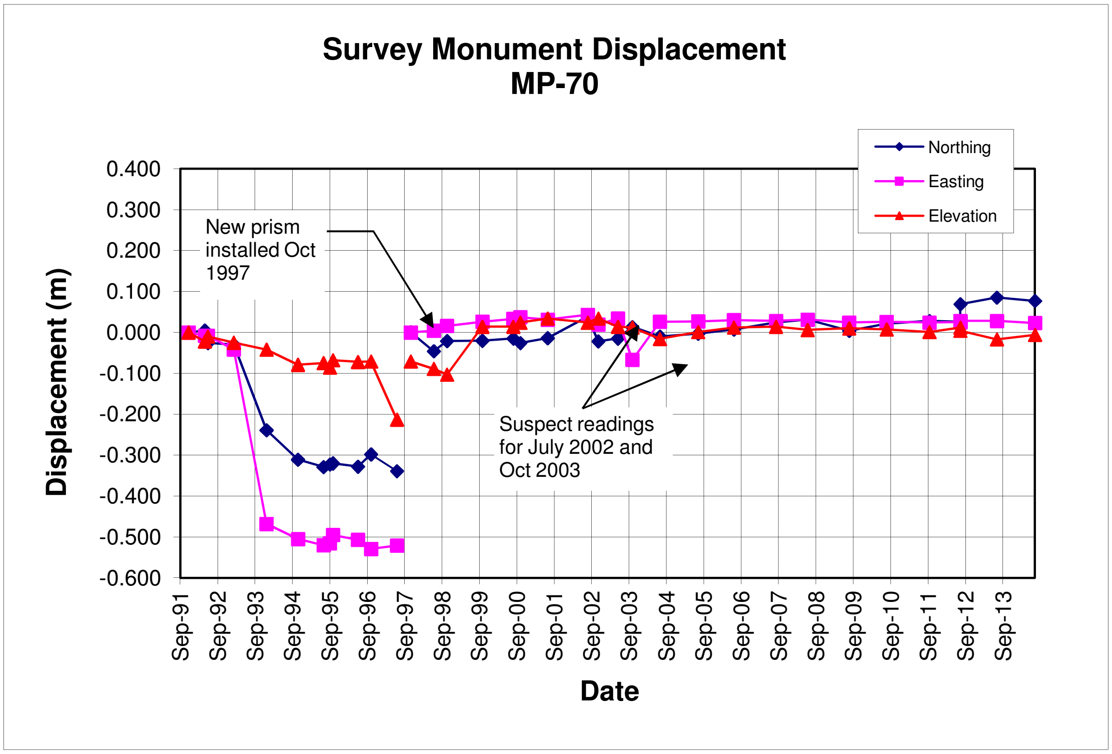

Survey Monument Displacement
MP-88
Displacement (m)
0.200
0.100
0.000
-0.100
-0.200
Northing
Easting
Elevation
New prism installed
Aug 2002
Sep-91 Sep-92 Sep-93 Sep-94 Sep-95 Sep-96 Sep-97 Sep-98 Sep-99 Sep-00 Sep-01 Sep-02 Sep-03 Sep-04 Sep-05 Sep-06 Sep-07 Sep-08 Sep-09 Sep-10 Sep-11 Sep-12 Sep-13
Date

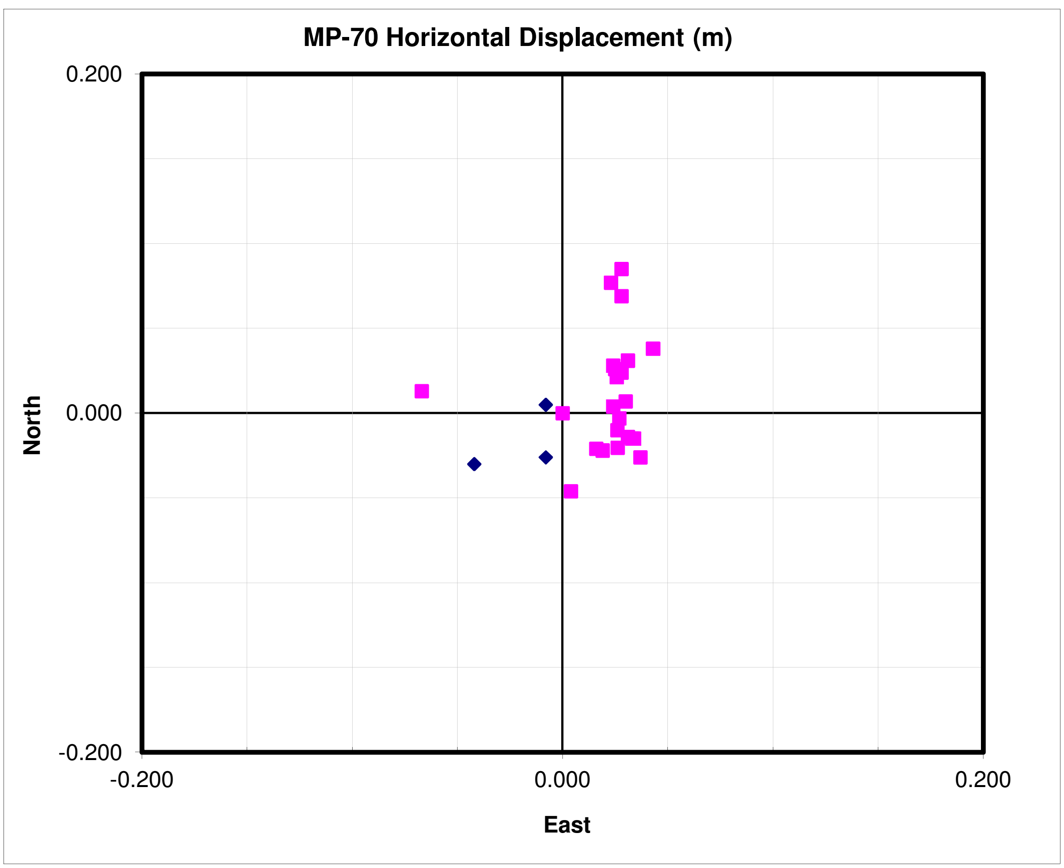

MP-88 Horizontal Displacement (m)
0.200
0.000
-0.200
North
-0.200
0.000
0.200
East

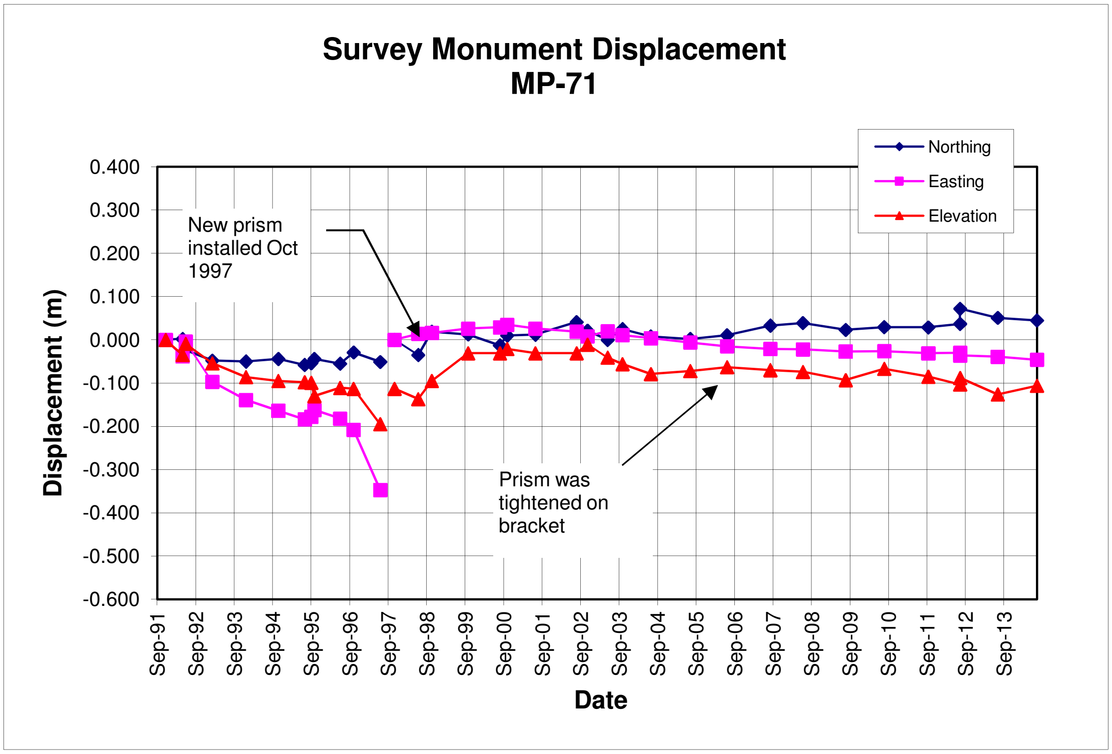

Survey Monument Displacement
MP-89 and MP-90
Displacement (m)
0.400
0.300
0.200
0.100
0.000
-0.100
-0.200
-0.300
-0.400
-0.500
-0.600
Northing
Easting
Elevation
MP-89 was replaced by MP-90 in Oct 1996
New prism installed Aug 2002
Sep-91
Sep-92
Sep-93
Sep-94
Sep-95
Sep-96
Sep-97
Sep-98
Sep-99
Sep-00
Sep-01
Sep-02
Sep-03
Sep-04
Sep-05
Sep-06
Sep-07
Sep-08
Sep-09
Sep-10
Sep-11
Sep-12
Sep-13
Date

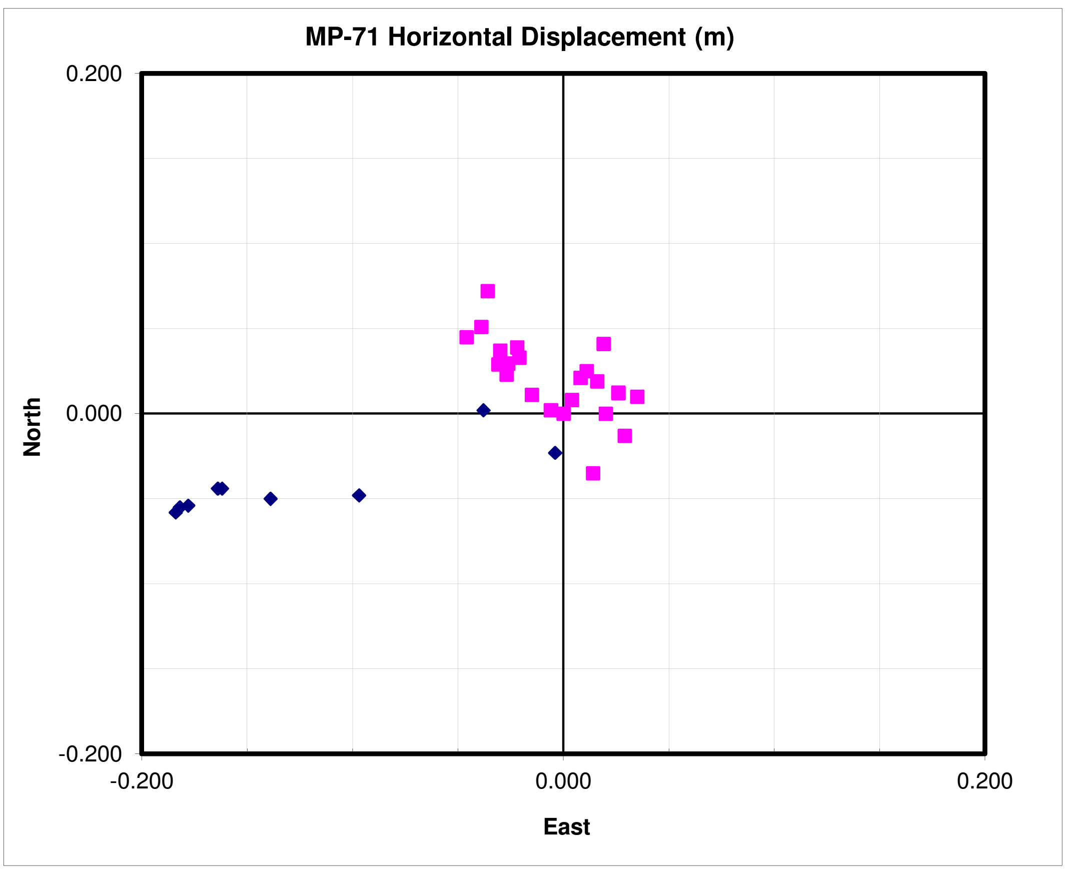

MP-89/90 Horizontal Displacement (m)
0.200
0.000
-0.200
North
-0.200
0.000
0.200
East

Diversion Dam (MP-70 to MP-72)

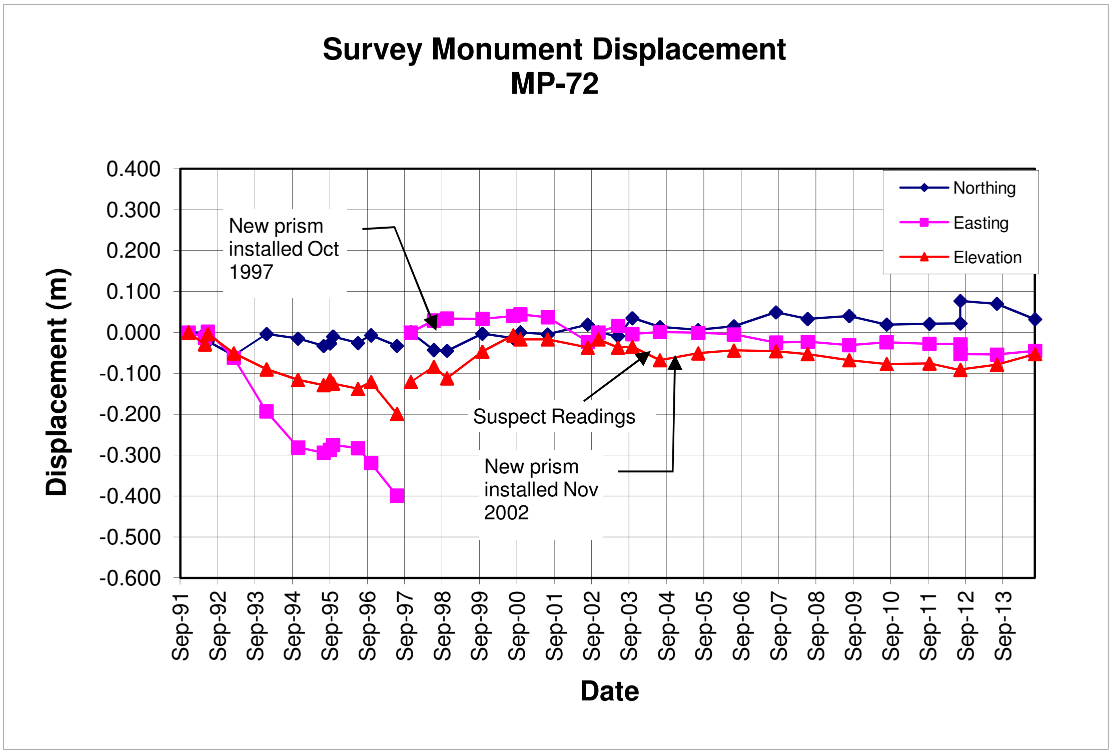

Survey Monument Displacement
MP-70
Northing
Easting
Elevation
New prism installed Oct 1997
Suspect readings for July 2002 and Oct 2003
Displacement (m)
0.400
0.300
0.200
0.100
0.000
-0.100
-0.200
-0.300
-0.400
-0.500
-0.600
Sep-91
Sep-92
Sep-93
Sep-94
Sep-95
Sep-96
Sep-97
Sep-98
Sep-99
Sep-00
Sep-01
Sep-02
Sep-03
Sep-04
Sep-05
Sep-06
Sep-07
Sep-08
Sep-09
Sep-10
Sep-11
Sep-12
Sep-13
Date

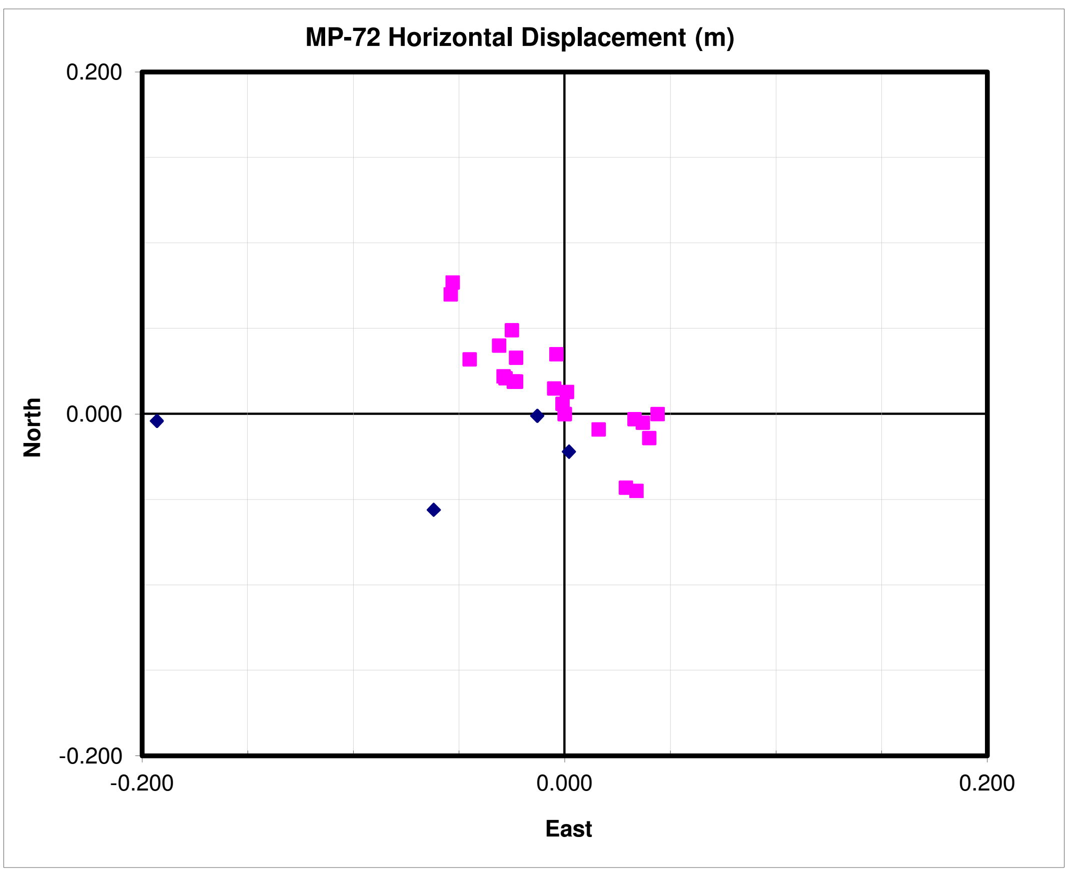

MP-70 Horizontal Displacement (m)
0.200
0.000
-0.200
North
-0.200
0.000
0.200
East


Survey Monument Displacement
MP-71
Northing
Easting
Elevation
New prism installed Oct 1997
Prism was tightened on bracket
Displacement (m)
0.400
0.300
0.200
0.100
0.000
-0.100
-0.200
-0.300
-0.400
-0.500
-0.600
Sep-91
Sep-92
Sep-93
Sep-94
Sep-95
Sep-96
Sep-97
Sep-98
Sep-99
Sep-00
Sep-01
Sep-02
Sep-03
Sep-04
Sep-05
Sep-06
Sep-07
Sep-08
Sep-09
Sep-10
Sep-11
Sep-12
Sep-13
Date


MP-71 Horizontal Displacement (m)
0.200
0.000
-0.200
North
-0.200
0.000
0.200
East

Appendix D

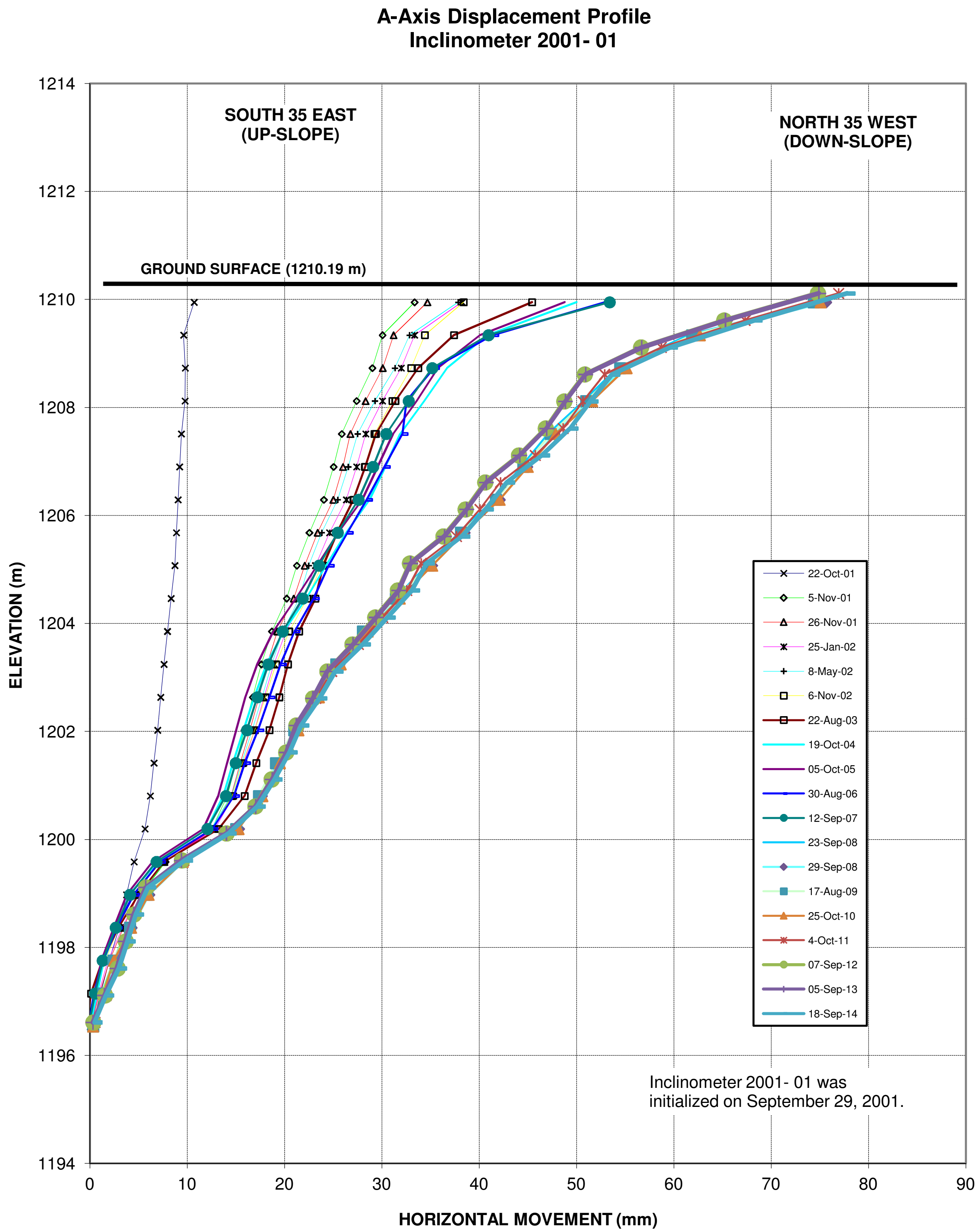

Survey Monument Displacement
MP-72
Displacement (m)
0.400
0.300
0.200
0.100
0.000
-0.100
-0.200
-0.300
-0.400
-0.500
-0.600
New prism installed Oct 1997
Suspect Readings
New prism installed Nov 2002
Northing
Easting
Elevation
Sep-91
Sep-92
Sep-93
Sep-94
Sep-95
Sep-96
Sep-97
Sep-98
Sep-99
Sep-00
Sep-01
Sep-02
Sep-03
Sep-04
Sep-05
Sep-06
Sep-07
Sep-08
Sep-09
Sep-10
Sep-11
Sep-12
Sep-13
Date

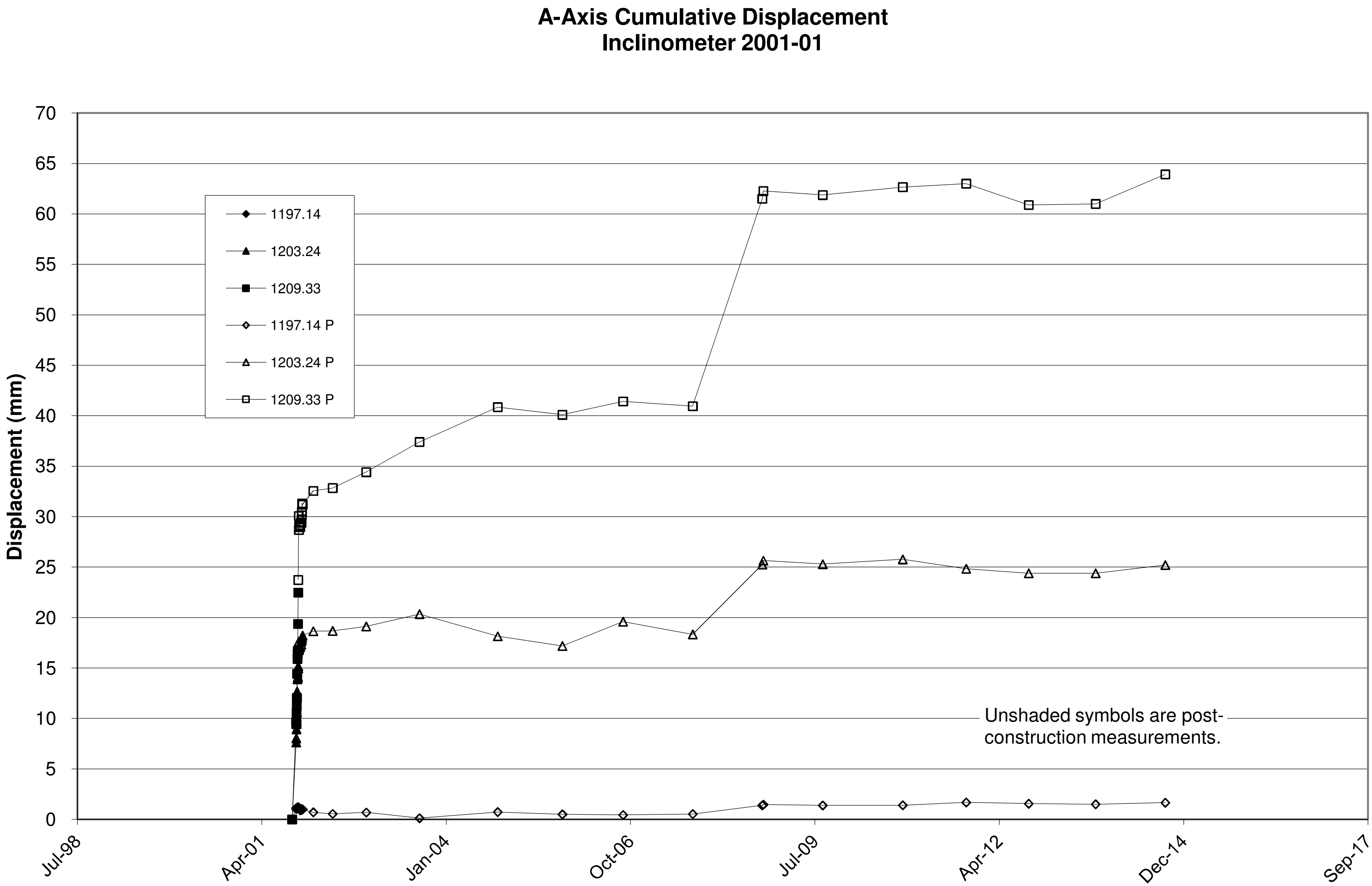

MP-72 Horizontal Displacement (m)
0.200
0.000
-0.200
North
-0.200
0.000
0.200
East

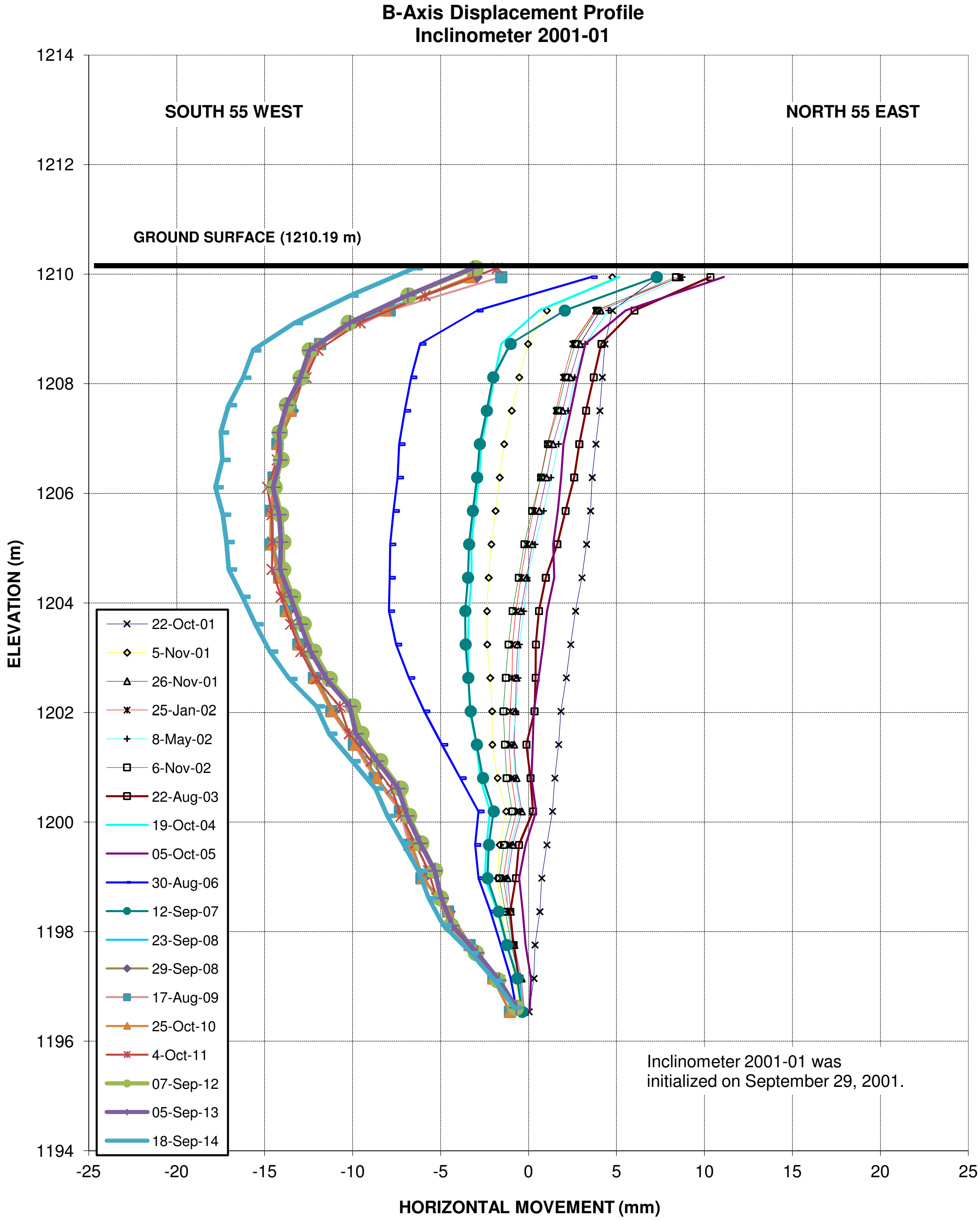
APPENDIX E

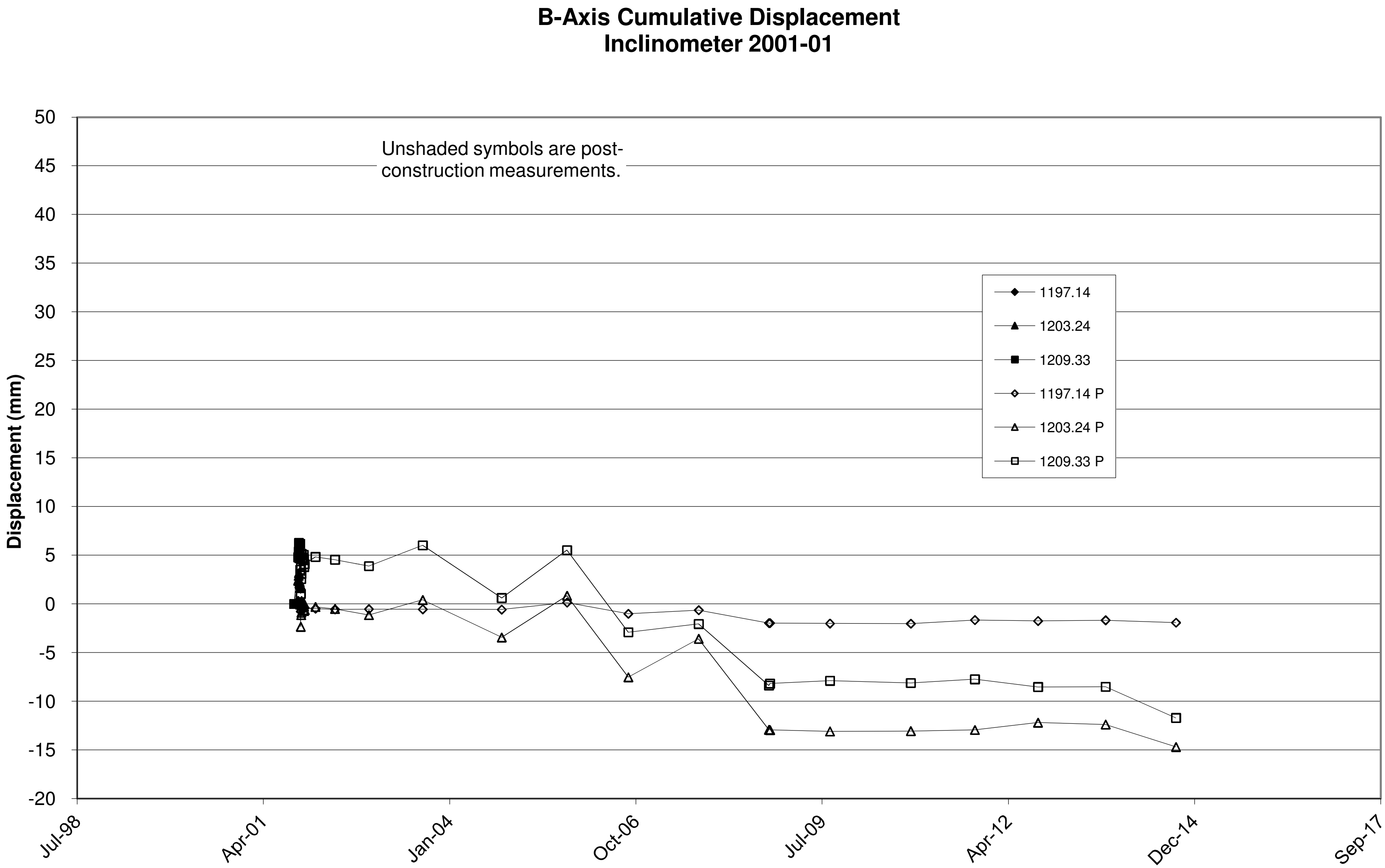
Main ARD Pond Slope Monitoring Data

Inclinometers

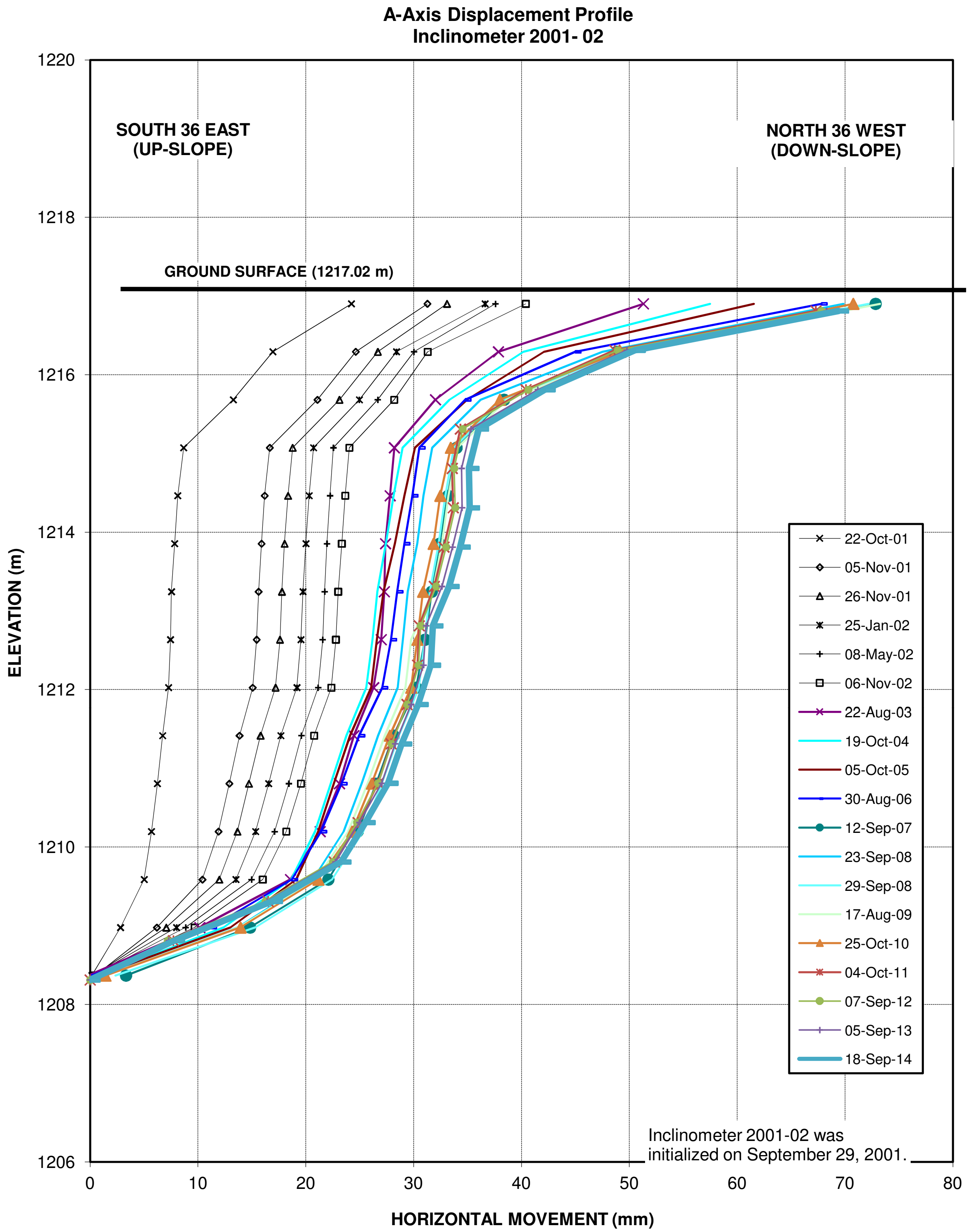

A-Axis Displacement Profile
Inclinometer 2001- 01
SOUTH 35 EAST
(UP-SLOPE)
NORTH 35 WEST
(DOWN-SLOPE)
GROUND SURFACE (1210.19 m)
ELEVATION (m)
HORIZONTAL MOVEMENT (mm)
1214
1212
1210
1208
1206
1204
1202
1200
1198
1196
1194
0
10
20
30
40
50
60
70
80
90
22-Oct-01
5-Nov-01
26-Nov-01
25-Jan-02
8-May-02
6-Nov-02
22-Aug-03
19-Oct-04
05-Oct-05
30-Aug-06
12-Sep-07
23-Sep-08
29-Sep-08
17-Aug-09
25-Oct-10
4-Oct-11
07-Sep-12
05-Sep-13
18-Sep-14
Inclinometer 2001- 01 was
initialized on September 29, 2001.


A-Axis Cumulative Displacement
Inclinometer 2001-01
Displacement (mm)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
1197.14
1203.24
1209.33
1197.14 P
1203.24 P
1209.33 P
Unshaded symbols are post-construction measurements.

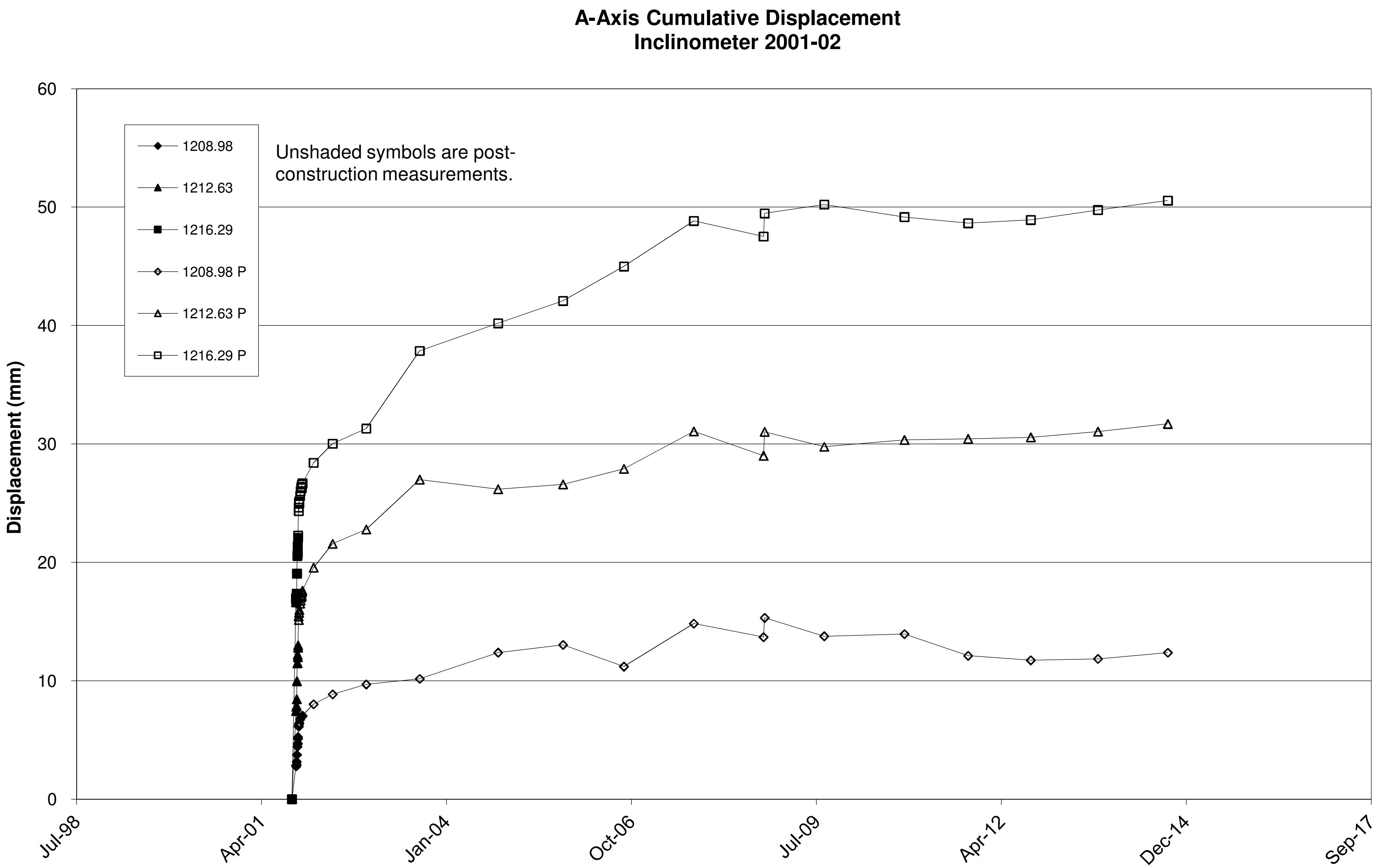

B-Axis Displacement Profile
Inclinometer 2001-01
SOUTH 55 WEST
NORTH 55 EAST
GROUND SURFACE (1210.19 m)
ELEVATION (m)
HORIZONTAL MOVEMENT (mm)
1214
1212
1210
1208
1206
1204
1202
1200
1198
1196
1194
-25
-20
-15
-10
-5
0
5
10
15
20
25
22-Oct-01
5-Nov-01
26-Nov-01
25-Jan-02
8-May-02
6-Nov-02
22-Aug-03
19-Oct-04
05-Oct-05
30-Aug-06
12-Sep-07
23-Sep-08
29-Sep-08
17-Aug-09
25-Oct-10
4-Oct-11
07-Sep-12
05-Sep-13
18-Sep-14
Inclinometer 2001-01 was
initialized on September 29, 2001.

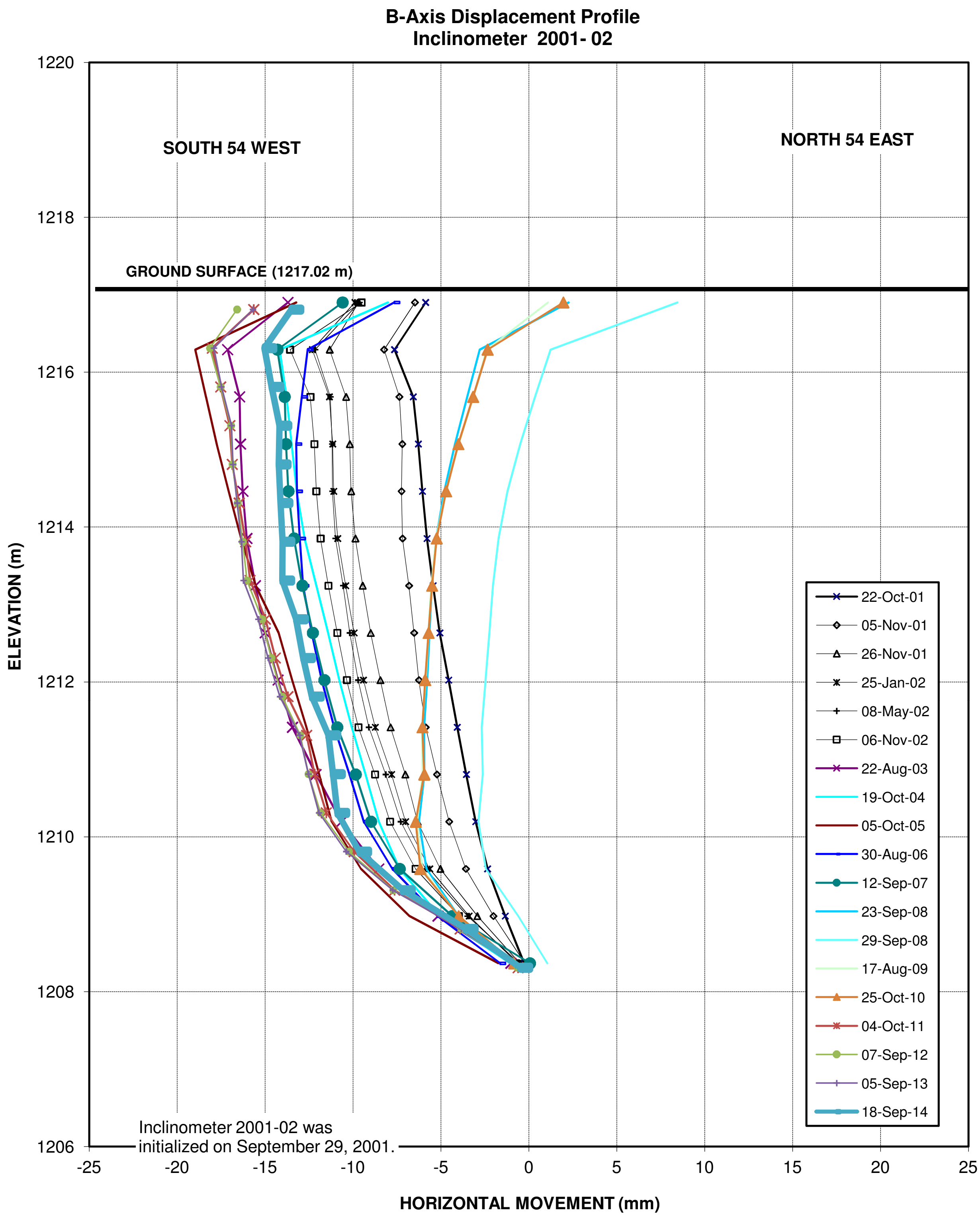

B-Axis Cumulative Displacement
Inclinometer 2001-01
Unshaded symbols are post-construction measurements.
Displacement (mm)
50
45
40
35
30
25
20
15
10
5
0
-5
-10
-15
-20
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
1197.14
1203.24
1209.33
1197.14 P
1203.24 P
1209.33 P

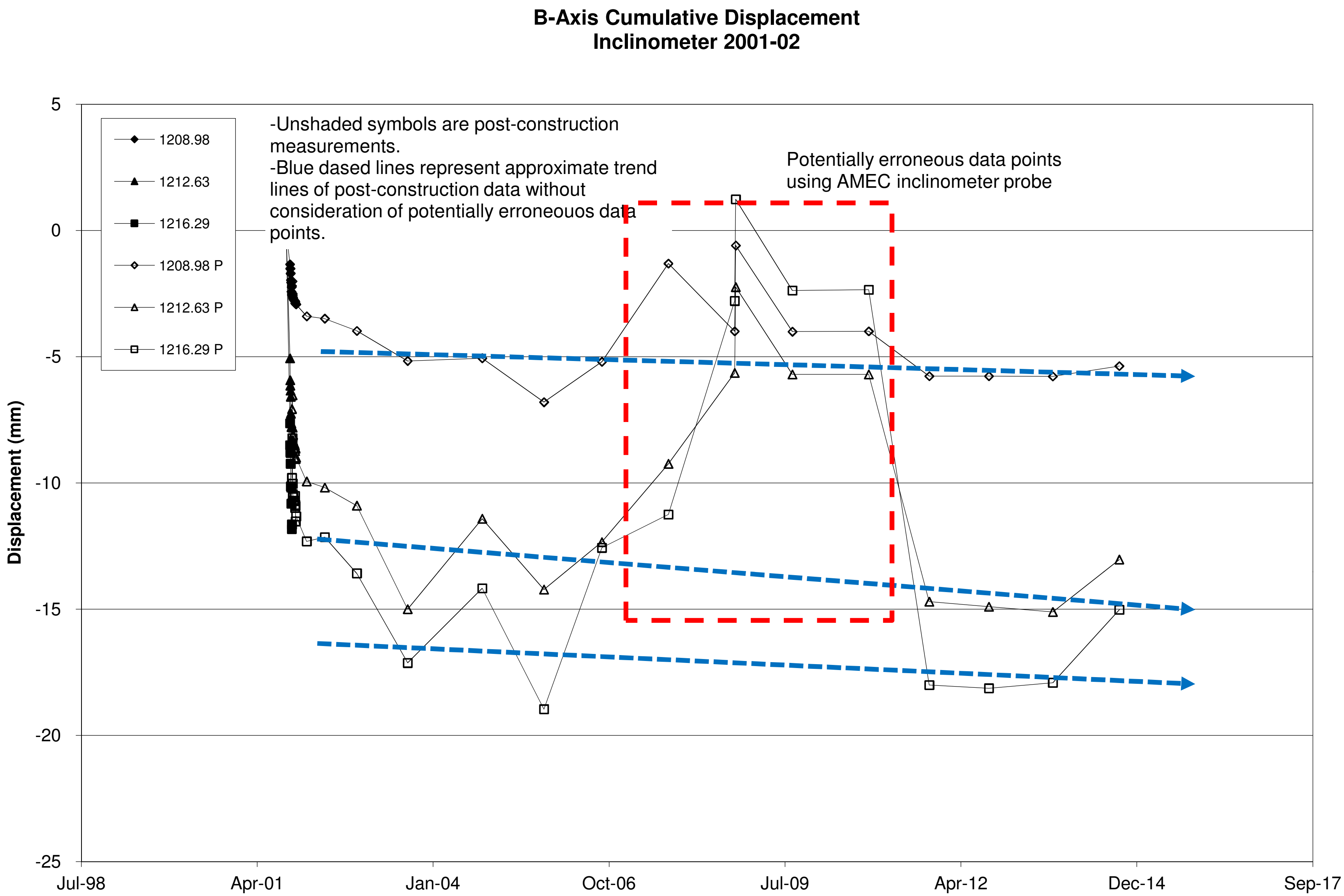
Appendix E


A-Axis Displacement Profile
Inclinometer 2001- 02
SOUTH 36 EAST (UP-SLOPE)
NORTH 36 WEST (DOWN-SLOPE)
GROUND SURFACE (1217.02 m)
ELEVATION (m)
HORIZONTAL MOVEMENT (mm)
1220
1218
1216
1214
1212
1210
1208
1206
0
10
20
30
40
50
60
70
80
22-Oct-01
05-Nov-01
26-Nov-01
25-Jan-02
08-May-02
06-Nov-02
22-Aug-03
19-Oct-04
05-Oct-05
30-Aug-06
12-Sep-07
23-Sep-08
29-Sep-08
17-Aug-09
25-Oct-10
04-Oct-11
07-Sep-12
05-Sep-13
18-Sep-14
Inclinometer 2001-02 was initialized on September 29, 2001.

Appendix E

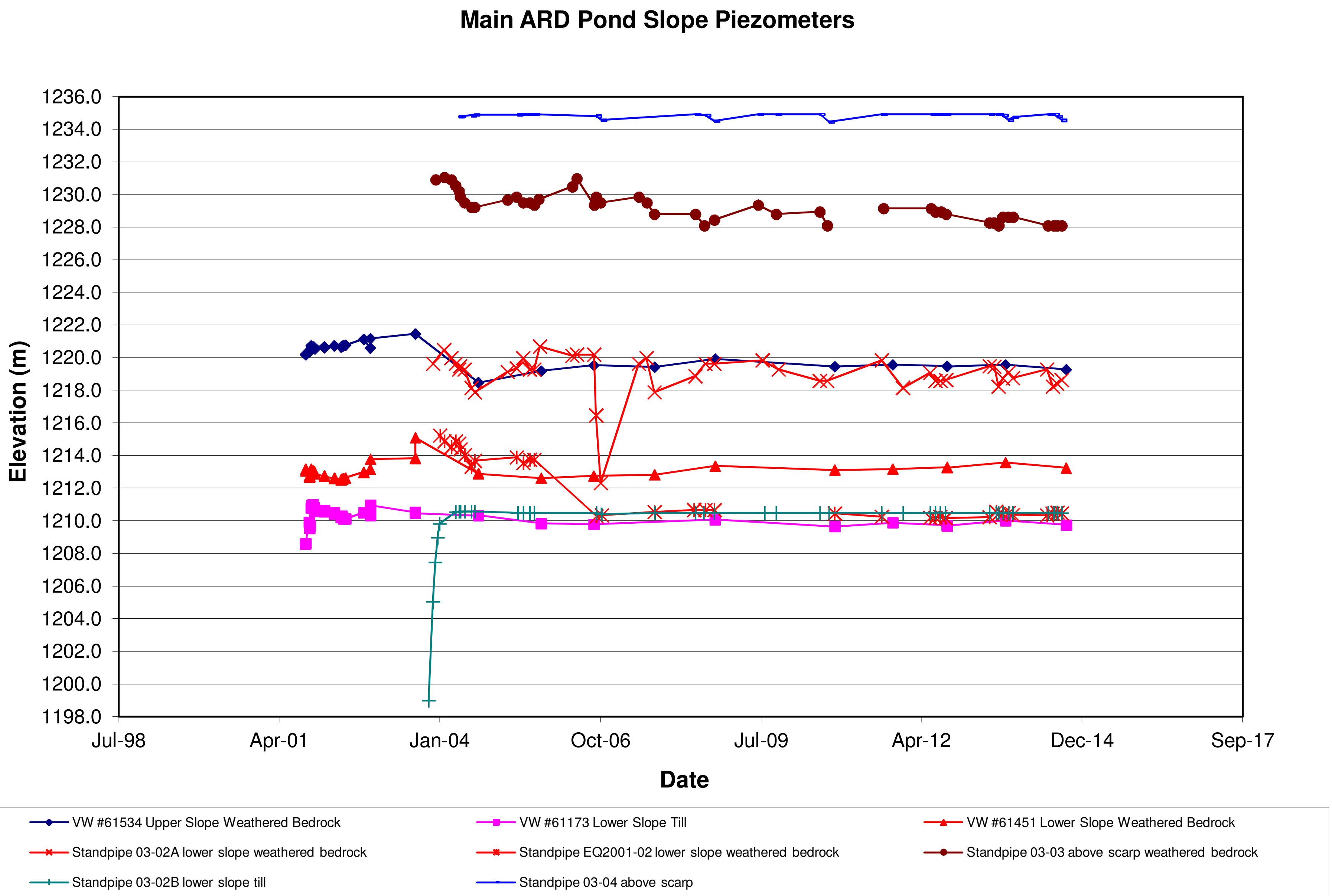

A-Axis Cumulative Displacement
Inclinometer 2001-02
Displacement (mm)
60
50
40
30
20
10
0
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
1208.98
1212.63
1216.29
1208.98 P
1212.63 P
1216.29 P
Unshaded symbols are post-construction measurements.


B-Axis Displacement Profile
Inclinometer 2001- 02
SOUTH 54 WEST
NORTH 54 EAST
GROUND SURFACE (1217.02 m)
ELEVATION (m)
HORIZONTAL MOVEMENT (mm)
1220
1218
1216
1214
1212
1210
1208
1206
-25
-20
-15
-10
-5
0
5
10
15
20
25
22-Oct-01
05-Nov-01
26-Nov-01
25-Jan-02
08-May-02
06-Nov-02
22-Aug-03
19-Oct-04
05-Oct-05
30-Aug-06
12-Sep-07
23-Sep-08
29-Sep-08
17-Aug-09
25-Oct-10
04-Oct-11
07-Sep-12
05-Sep-13
18-Sep-14
Inclinometer 2001-02 was initialized on September 29, 2001.

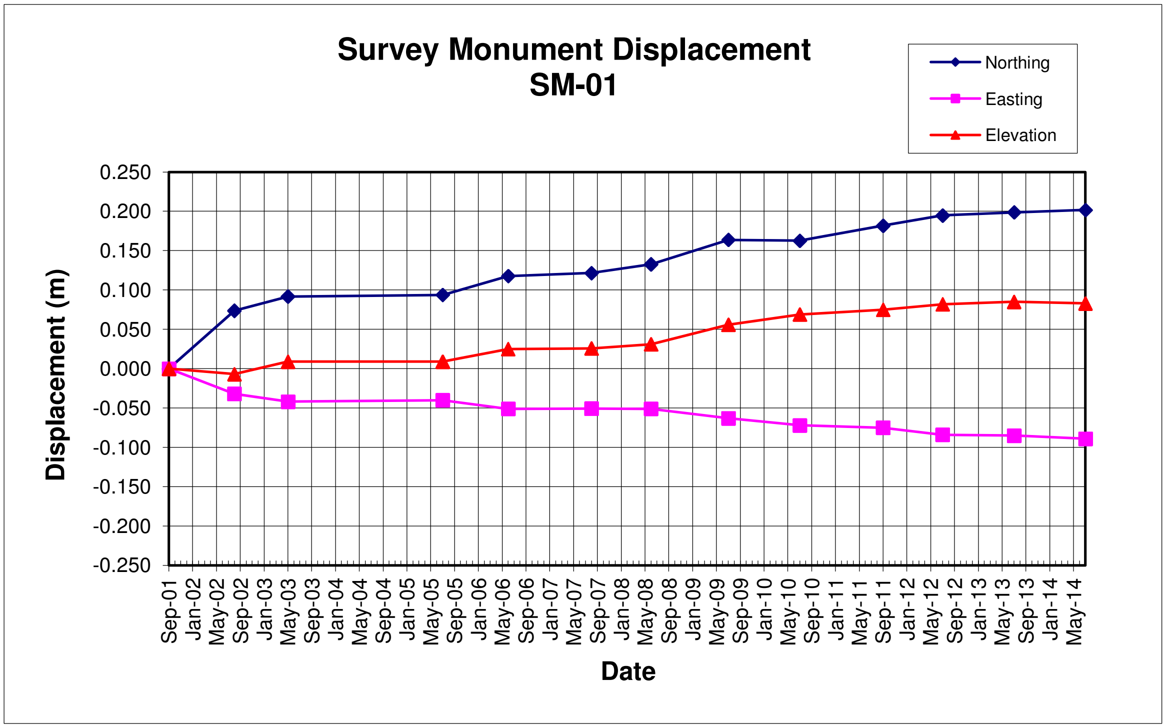

B-Axis Cumulative Displacement
Inclinometer 2001-02
Displacement (mm)
5
0
-5
-10
-15
-20
-25
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
1208.98
1212.63
1216.29
1208.98 P
1212.63 P
1216.29 P
-Unshaded symbols are post-construction measurements.
-Blue dased lines represent approximate trend lines of post-construction data without consideration of potentially erroneouos data points.
Potentially erroneous data points using AMEC inclinometer probe

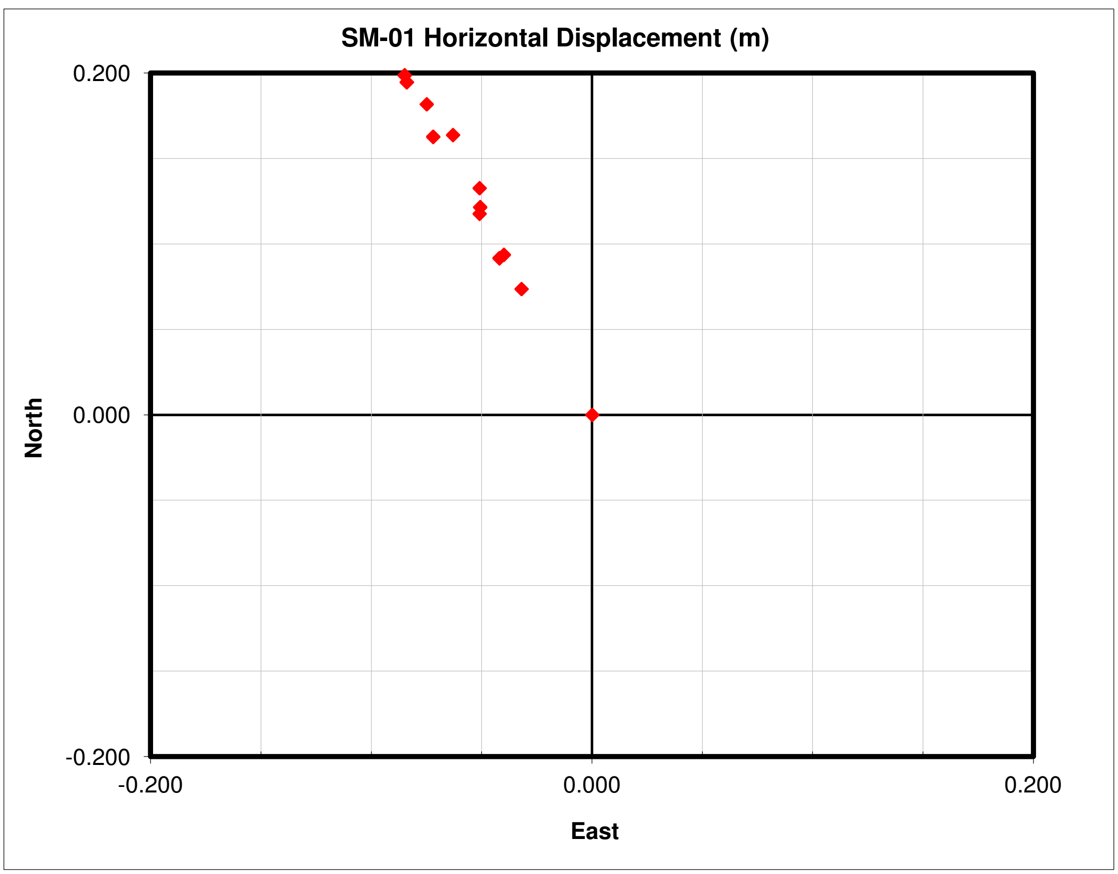
Piezometers

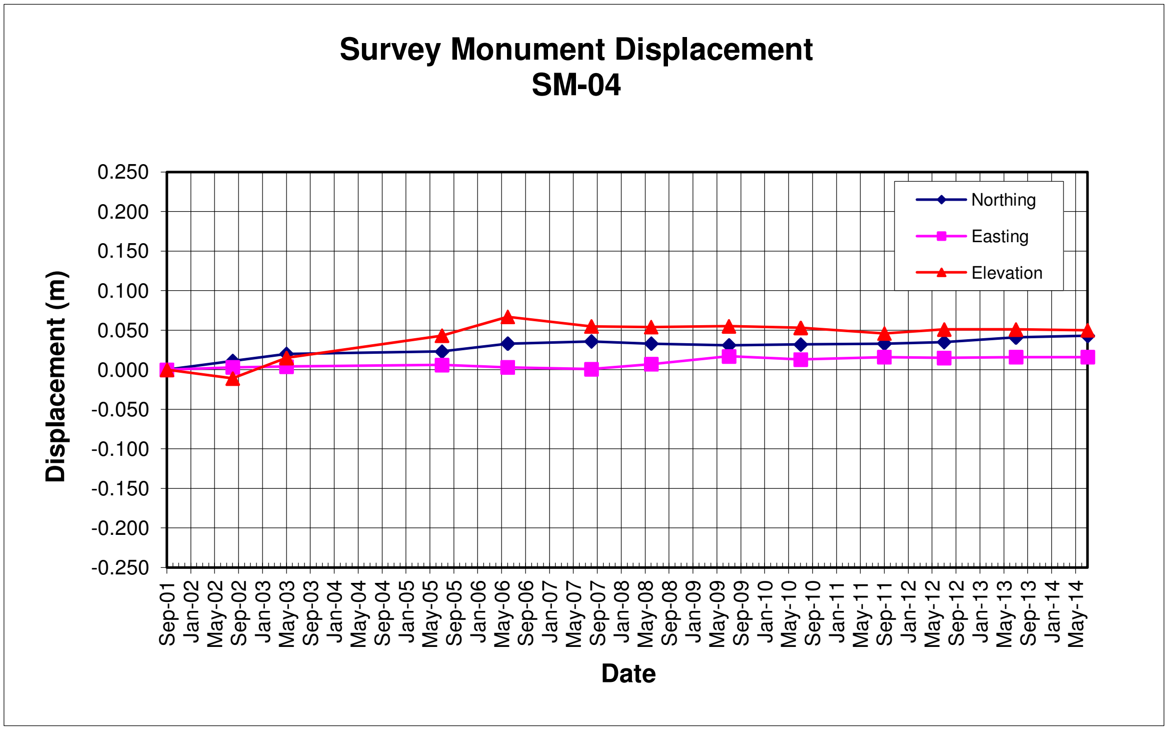
Appendix E

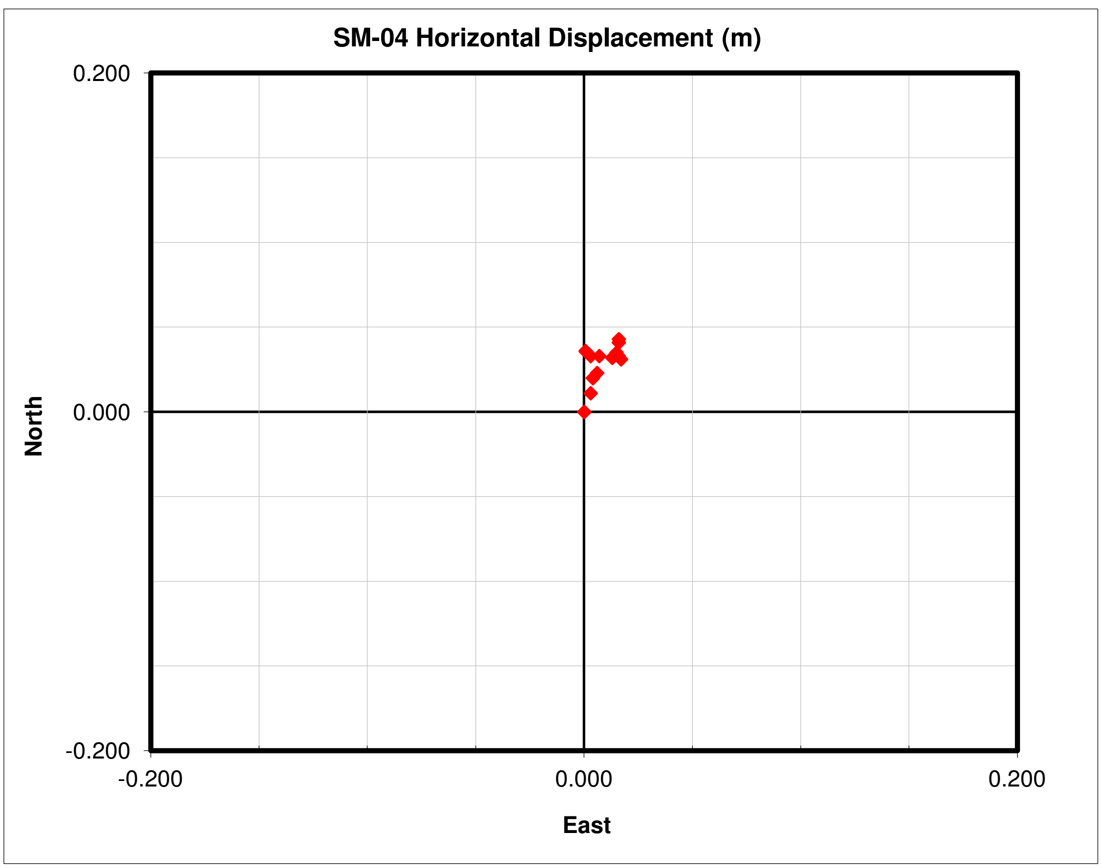

Main ARD Pond Slope Piezometers
Elevation (m)
1236.0
1234.0
1232.0
1230.0
1228.0
1226.0
1224.0
1222.0
1220.0
1218.0
1216.0
1214.0
1212.0
1210.0
1208.0
1206.0
1204.0
1202.0
1200.0
1198.0
Jul-98
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Date
VW #61534 Upper Slope Weathered Bedrock
VW #61173 Lower Slope Till
VW #61451 Lower Slope Weathered Bedrock
Standpipe 03-02A lower slope weathered bedrock
Standpipe EQ2001-02 lower slope weathered bedrock
Standpipe 03-03 above scarp weathered bedrock
Standpipe 03-02B lower slope till
Standpipe 03-04 above scarp

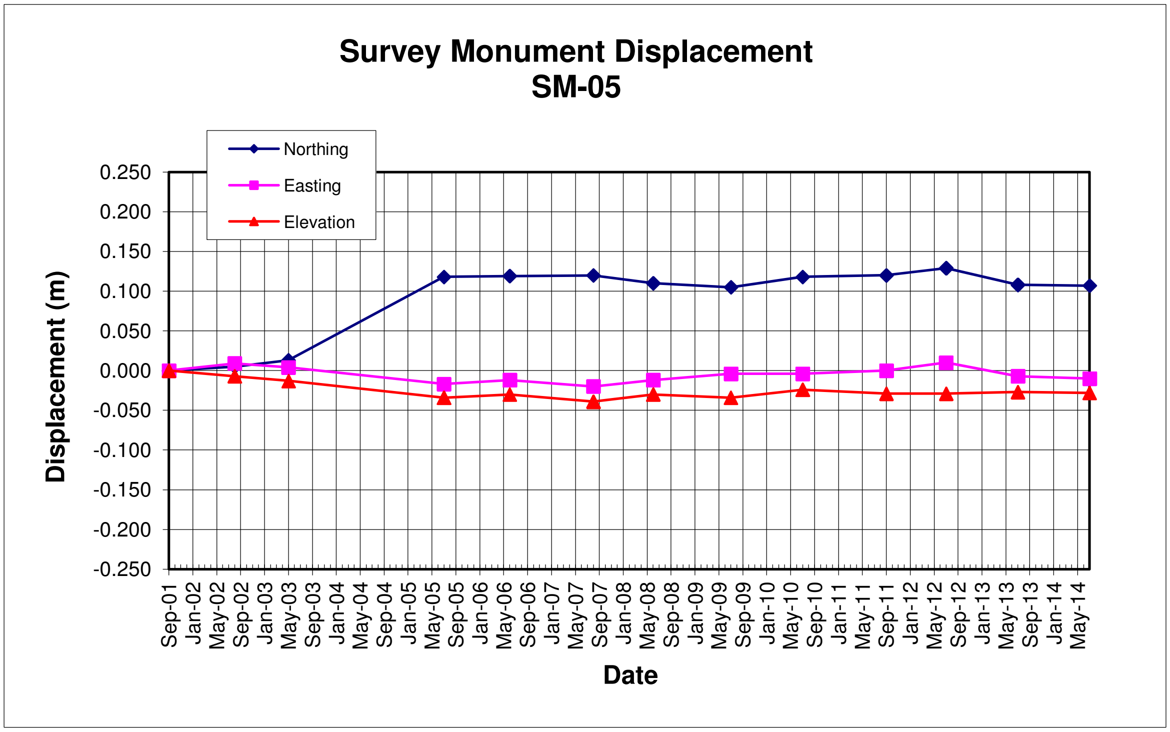
Survey Monuments

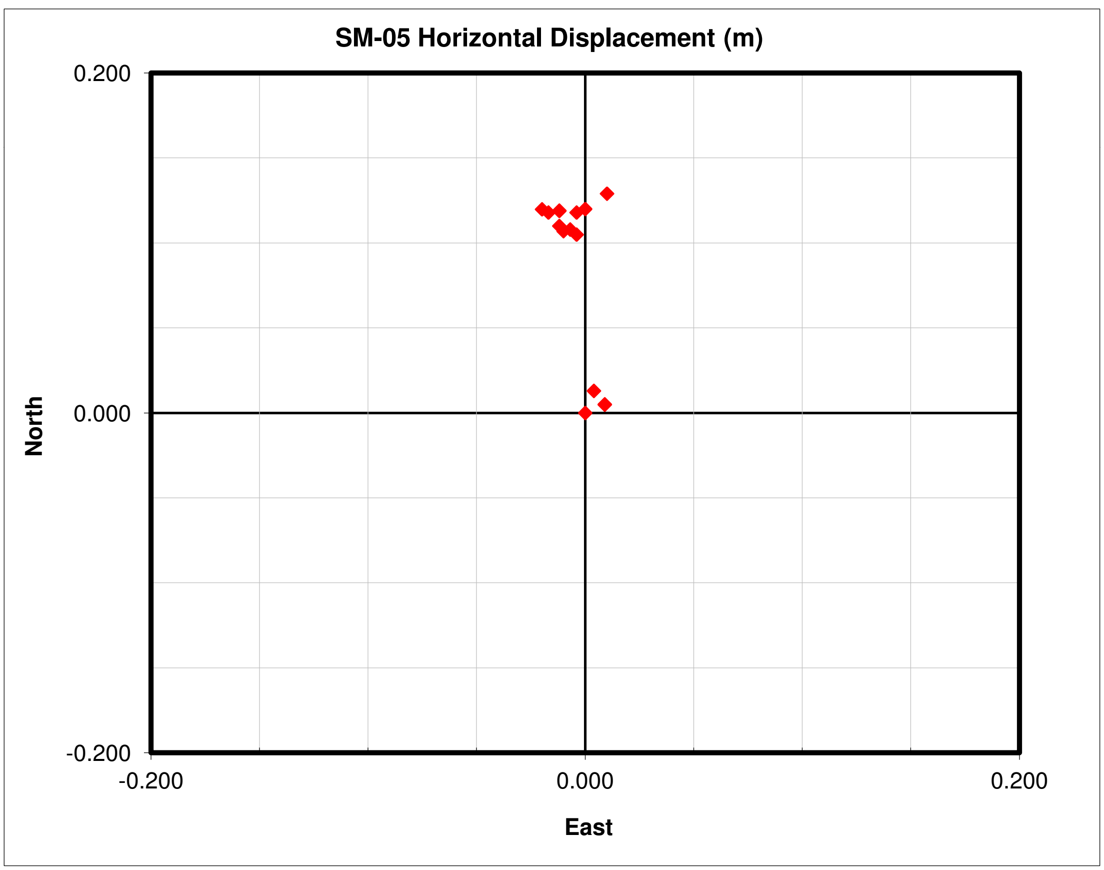

Survey Monument Displacement
SM-01
Northing
Easting
Elevation
Displacement (m)
0.250
0.200
0.150
0.100
0.050
0.000
-0.050
-0.100
-0.150
-0.200
-0.250
Sep-01
Jan-02
May-02
Sep-02
Jan-03
May-03
Sep-03
Jan-04
May-04
Sep-04
Jan-05
May-05
Sep-05
Jan-06
May-06
Sep-06
Jan-07
May-07
Sep-07
Jan-08
May-08
Sep-08
Jan-09
May-09
Sep-09
Jan-10
May-10
Sep-10
Jan-11
May-11
Sep-11
Jan-12
May-12
Sep-12
Jan-13
May-13
Sep-13
Jan-14
May-14
Date

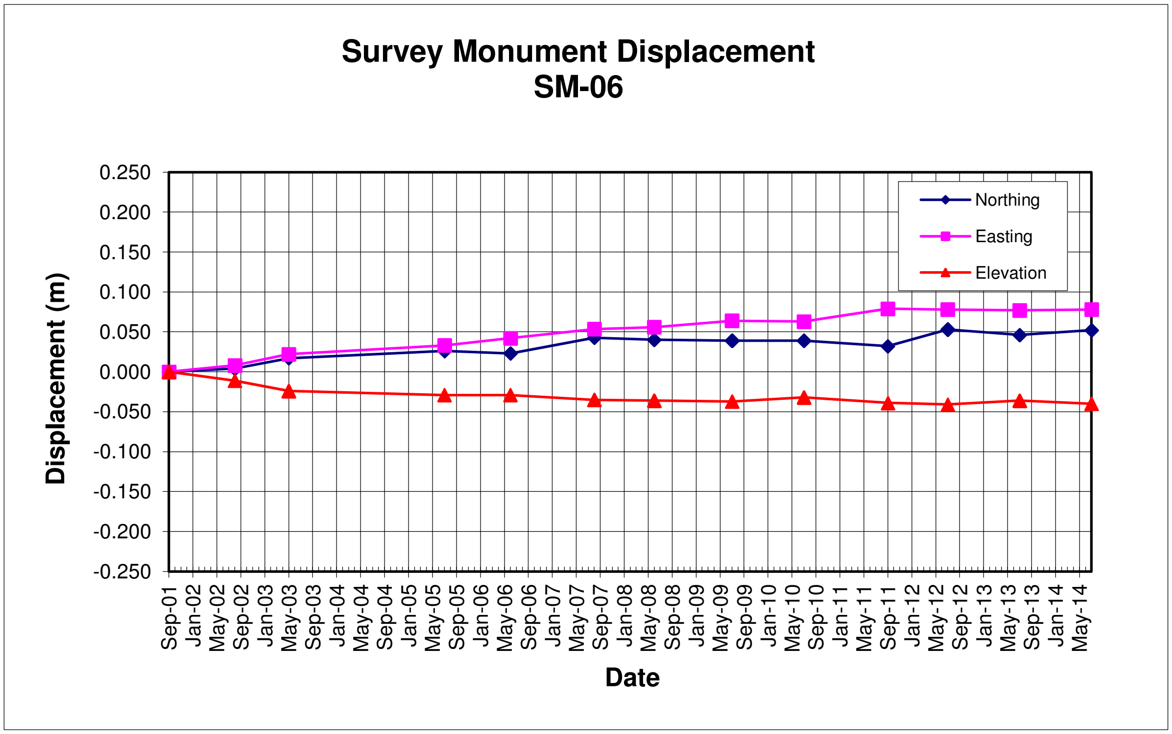

SM-01 Horizontal Displacement (m)
0.200
0.000
-0.200
North
-0.200
0.000
0.200
East

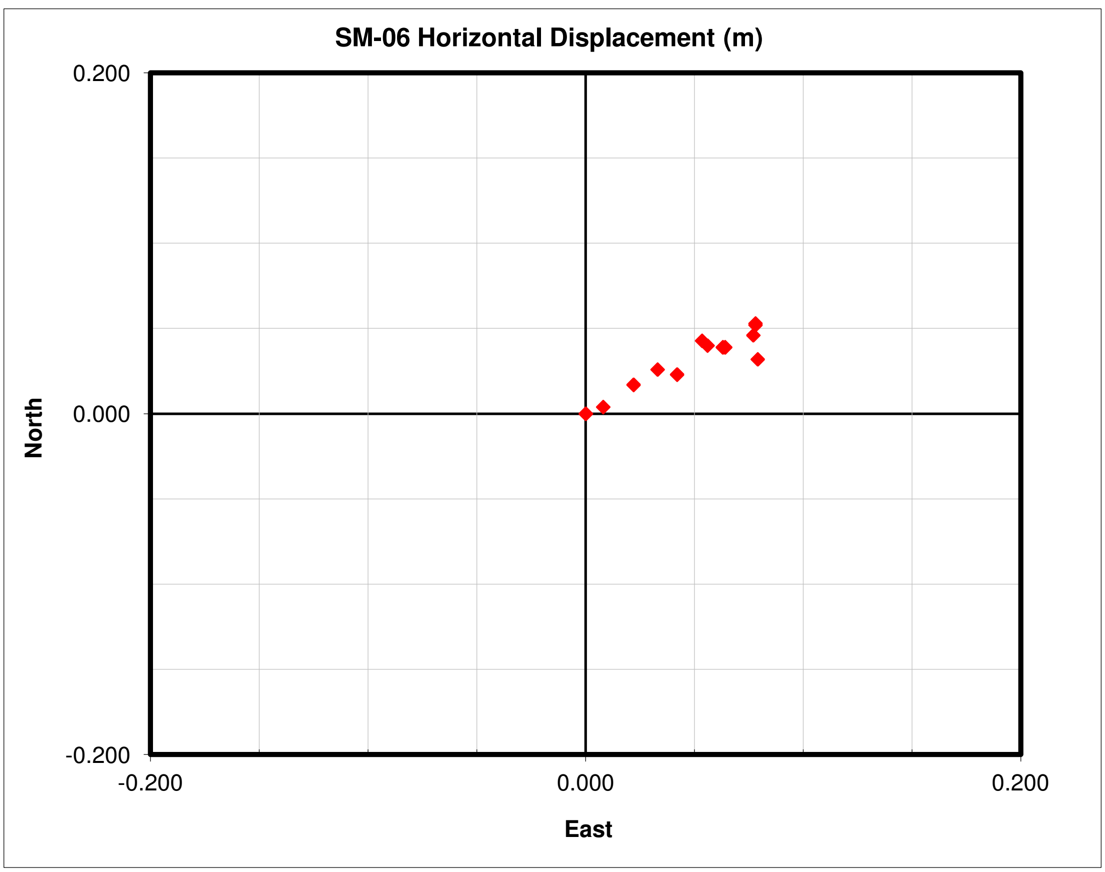

Survey Monument Displacement
SM-04
Displacement (m)
0.250
0.200
0.150
0.100
0.050
0.000
-0.050
-0.100
-0.150
-0.200
-0.250
Northing
Easting
Elevation
Sep-01
Jan-02
May-02
Sep-02
Jan-03
May-03
Sep-03
Jan-04
May-04
Sep-04
Jan-05
May-05
Sep-05
Jan-06
May-06
Sep-06
Jan-07
May-07
Sep-07
Jan-08
May-08
Sep-08
Jan-09
May-09
Sep-09
Jan-10
May-10
Sep-10
Jan-11
May-11
Sep-11
Jan-12
May-12
Sep-12
Jan-13
May-13
Sep-13
Jan-14
May-14
Date


SM-04 Horizontal Displacement (m)
0.200
0.000
-0.200
North
-0.200
0.000
0.200
East


Survey Monument Displacement
SM-05
Northing
Easting
Elevation
Displacement (m)
0.250
0.200
0.150
0.100
0.050
0.000
-0.050
-0.100
-0.150
-0.200
-0.250
Sep-01
Jan-02
May-02
Sep-02
Jan-03
May-03
Sep-03
Jan-04
May-04
Sep-04
Jan-05
May-05
Sep-05
Jan-06
May-06
Sep-06
Jan-07
May-07
Sep-07
Jan-08
May-08
Sep-08
Jan-09
May-09
Sep-09
Jan-10
May-10
Sep-10
Jan-11
May-11
Sep-11
Jan-12
May-12
Sep-12
Jan-13
May-13
Sep-13
Jan-14
May-14
Date


SM-05 Horizontal Displacement (m)
0.200
0.000
-0.200
North
-0.200
0.000
0.200
East


Survey Monument Displacement
SM-06
Displacement (m)
0.250
0.200
0.150
0.100
0.050
0.000
-0.050
-0.100
-0.150
-0.200
-0.250
Northing
Easting
Elevation
Sep-01
Jan-02
May-02
Sep-02
Jan-03
May-03
Sep-03
Jan-04
May-04
Sep-04
Jan-05
May-05
Sep-05
Jan-06
May-06
Sep-06
Jan-07
May-07
Sep-07
Jan-08
May-08
Sep-08
Jan-09
May-09
Sep-09
Jan-10
May-10
Sep-10
Jan-11
May-11
Sep-11
Jan-12
May-12
Sep-12
Jan-13
May-13
Sep-13
Jan-14
May-14
Date


SM-06 Horizontal Displacement (m)
0.200
0.000
-0.200
North
-0.200
0.000
0.200
East