

August 16, 2013

Yukon Zinc Corp.  
#701 – 475 Howe Street  
Vancouver, British Columbia  
V6C 2B3

**Robin McCall**  
**Wolverine Mine Environmental Superintendent**

Dear Mr. McCall:

**Wolverine Mine Tailings Facility**  
**2013 Annual Tailings Facility Physical Inspection**

## **1 INTRODUCTION**

### **1.1 General**

This letter report presents the findings from the annual inspection of the Wolverine Tailings Facility as required by Quartz Mining License QML-0006. The inspection was carried out on July 16 to July 18, 2013 by Mr. Lowell Constable of Klohn Crippen Berger Ltd. (KCB). This report includes a summary of the stability and status of inspected structures, and provides recommendations for remedial action where necessary.

The starter dam for the Wolverine tailings facility was constructed in 2009 and 2010 and was commissioned in October 2009. The main facility components that were constructed in 2009 include:

- A 19 m high homogeneous earthfill dam constructed with borrow material excavated from the impoundment area.
- A 40 mil LLDPE geomembrane liner over the impoundment area. The liner is anchored into the dam crest and perimeter of the impoundment in a ditch backfilled with soil.
- Diversion Ditch A and Diversion Ditch B, which direct non-contact runoff water around the impoundment.

The main facility components that were constructed in 2010 include:

- The reclaim pump barge and access ramp.
- Tailings delivery pipelines and water reclaim pipelines.
- Starter dam emergency spillway.
- Seepage recovery pond dyke and water pump-back system.
- Monitoring instrumentation.

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The dam was raised in 2012 to the Stage 2 crest elevation (El. 1313.5 m). The main facility components that were constructed in 2012 include:

- a 6 m high downstream dam raise;
- a 60-mil LLDPE liner on the raised impoundment;
- relocated Diversion A, to direct non-contact surface water around the impoundment; and
- riprap lined emergency spillway.

The tailings impoundment has been accumulating water from runoff, mine discharge, and the sewage treatment plant since October 2009. Tailings have been discharged to the impoundment since September 2010. The tailings solids volume at the time of the site visit was approximately 389,300 m<sup>3</sup>. This was taken from reported tailings tonnages provided by YZC at an assumed *in situ* density of 1.6 t/m<sup>3</sup>. The volume of water at the time of the site visit was approximately 393,000 m<sup>3</sup>, based on the total volume estimated from the pond elevation and the as-built stage-storage curve.

## 1.2 Dam Classification

The Canadian Dam Association Dam Safety Guidelines (CDA 2007) were adopted to confirm the classification of the tailings facility for seismic and flood protection criteria. The selected dam classification, based on the dam break analysis and assessment of consequences of failure is “High” to “Very High”, and the criteria for Very High has been selected for design. The use of the Very High rating provides additional security for the long term performance of the tailings facility after closure.

The impoundment is designed to safely route the 1:10,000 year return period flood through the Stage 2 spillway located in the west flank of the dam. During operations, the tailings facility will also store the 1:200 year return-period flood event, without the release of water. The design earthquake is a 1:10,000 year return period, with a peak ground acceleration of 0.22 g. The minimum geotechnical factors of safety during operations are 1.5 for static stability and 1.1 for pseudo-static stability.

## 1.3 Documentation

The main documentation for the Wolverine Tailings Facility includes:

- Yukon Zinc Corp., Wolverine Project, Tailings Facility, *Operations, Maintenance and Surveillance (OMS) Manual*, V2010-01, August 2010.
- Klohn Crippen Berger Ltd. (2009). *Wolverine Project - Tailings and Related Infrastructure Design and Construction Plan*, V2009-02. Vancouver: Klohn Crippen Berger Ltd.
- Klohn Crippen Berger Ltd. (2010). *Wolverine Project – Starter Tailings Storage Facility – 2009 Civil Works Construction Summary Report*. Vancouver: Klohn Crippen Berger Ltd.
- Klohn Crippen Berger Ltd. (2011a). 2010 Civil Works Addendum to *Starter Tailings Storage Facility – 2009 Civil Works Construction Summary Report*. Vancouver: Klohn Crippen Berger Ltd.

- Klohn Crippen Berger Ltd. (2011b). *Annual Tailings Facility Physical Inspection*.
- Klohn Crippen Berger Ltd. (2012). *2012 Civil Works Construction Summary Report*. Vancouver: Klohn Crippen Berger Ltd.
- Yukon Water Board. (2007, October 4). Type A Water Use Licence QZ04-065. Whitehorse, YT, Canada.

## 2 SITE INSPECTION OBSERVATIONS

A walkover inspection of the facility was carried out during the July 16 to July 18 site visit. Observations of various components of the facility were made and these are documented in the following sections for record purposes. Weather during the site visit was overcast, with occasional light showers. Select photos of the facilities are provided in Appendix I.

### 2.1 Dam

- The dam is in good condition and there are no signs of settlement, cracking or slope movement. Some minor cracks were observed around the reclaim line on the dam crest, likely due to surficial settlement due to local loading.
- In 2011 there had been clear seepages along the toe of the starter dam), observed and noted in the 2011 Annual Tailings Facility Inspection Report. The seepages were buried during the 2011 dam raise and have not reappeared.
- A moist area (as evidenced by a slight colour change) mid-way up the dam slope, observed and noted in the 2011 Annual Tailings Facility Inspection Report, has not reappeared on the face of the Stage 2 dam.

### 2.2 Stage 2 Dam Emergency Spillway

The spillway would only be used during an extreme event (e.g. >200 year flood) when the impoundment is near full storage capacity. The spillway is located within natural ground. The spillway outlet consists of a riprap lined channel through the dam crest.

Currently the spillway channel reports to the east ditch along the Mine Haul Road. The closure spillway design extends the flow channel across the Mine Haul Road to report to the existing catch basin above Go Creek. YZC plans to assess their mine plan and extend the spillway to the catch basin for closure.

### 2.3 Impoundment Area and LLDPE Geomembrane Liner

- The liner was generally in good condition. One minor tear was observed and YZC reported having to occasionally patch small holes in the liner. They inspect the liner for defects as a part of routine surveillance as laid out in the OMS. Defects are not considered a concern provided they are small and patched when they are found.
- Some rippling of the liner has occurred due to expansion/contraction in hot weather and to original placement procedures. This is not considered to be a concern.

- The north slope has what appear to be small “sloughs”. These are likely due to the loose soil on the slope on which the liner has been installed. As the water level and tailings level in the impoundment rises, the area is stabilized, and as such is not a concern.
- Cracking was observed along the crest at the north end of the impoundment, and ranged from 1 mm to 7 cm wide. Cracks did not appear to propagate deeper than approximately 10 cm, and may have been due to settlement of material around the liner anchor trench. KCB recommends the material be regarded to minimize water ingress into the cracks, recompacted, and then inspected weekly to see if the cracks reopen.

## 2.4 Liner Underdrains

The liner underdrains, which consist of a French drain with a perforated pipe under the liner and two solid pipes under the dam, are performing as designed. The inflows into the underdrains at the upstream end of the impoundment consist of 0.5 L/s from the area between Ditch A and the underdrain inlet.

The flow out of the underdrains daylighting downstream of the seepage dam is approximately 6 L/s, indicating that the underdrains beneath the LLDPE liner are collecting approximately 5.5 L/s.

The purpose of the underdrains was to relieve uplift pressure on the liner during construction. As the impoundment becomes full, and the weight of water and tailings increases, the requirement for the underdrain diminishes and they will be decommissioned at a later stage of operations.

## 2.5 Seepage Recovery Pond and Dyke

The seepage recovery pond is a contingency structure which was installed to provide further security against the very low risk of impoundment seepage. The dam is formed by the mine access road and extreme flood flows are routed through a spillway culvert through the dam. As in 2011, water collected in the seepage recovery pond is currently pumped back to the tailings impoundment. The seepage impoundment area consists of an irregular pond partially shaped by areas excavated for construction of the main dam and the natural topography.

The spillway culverts in the seepage pond exits into a rockfill channel-stilling area, which flows towards Go Creek. The rockfill appeared to be in good condition and will function to control erosion during extreme events.

## 2.6 Diversion Ditch A and Diversion Ditch B

Diversion Ditch B had no observed flow in the channel east of the tailings impoundment. The soils in the base of the ditch and along the slope that the ditch traverses are relatively pervious and most slope runoff appears to infiltrate into the slope. The ditch exits into a culvert, which extends down the slope towards the toe of the seepage dam, where it outlets into a rockfill stilling basin. The stilling basin was in good condition. ~0.1 L/s was observed coming out of the culvert on the downstream end.

Diversion Ditch A was in good condition. Coconut mats had been used to limit sediments from the 2012 construction season from entering the culvert and reporting to Go Creek. The matting had

partially blocked the culverts and water had built up in the ditch to as much as 1 m deep. YZC plans to adjust matting away from the culvert inlet to release the backed up water and lower the water level in the ditch. The ditch exits into a culvert and rockfill stilling basin. The stilling basin was in good condition. The flow into the stilling basin was  $\sim 2$  L/s.

## 2.7 Other Infrastructure

The tailings water reclaim pump barge, pumps and reclaim water lines have been installed and are readily accessible with a ramp down the upstream slope of the dam. Short stretches of the outer reclaim pipe wall had been damaged by equipment during relocation during the 2012 construction, but there was no indication reported by YZC that the damage was limiting the performance of the pipeline.

The tailings delivery pipelines were in place to the northwest side of the impoundment.

The tailings water reclaim pump barge and pumps are in place at the south end of the impoundment. A thick conveyor liner has been placed under the ramp to protect the geomembrane liner. The installation appears to have been carried out well and no areas of liner damage were observed. The design called for relocation of the reclaim barge closer to the final spillway, and relocation of the tailings deposition spigots to the crest of the main dam, in order to gradually move the pond away from the dam face and closer to the spillway for closure. Alternatives for relocating the reclaim barge should be assessed and a plan put in place for this work.

Construction of a water treatment plant has been delayed, and as such the impoundment is currently storing more water than anticipated. Since the current volume of tailings is less than anticipated the overall current storage volume is close to what was predicted by the design water balance. YZC is in process of reviewing the water balance to assess the impact of the updated timeline for construction of the water treatment plant.

## 2.8 Waste Rock Pad

North of the tailings facility is a temporary lined waste rock storage pad. The diversion ditches had been improved since the last site visit by the inspecting engineer, which was conducted during the 2012 construction season. The service layer above the liner which had not been covered by waste rock was washed out and loose. Since the waste rock is currently being removed and complete removal of the stockpile is planned over the next year, remediation of the reduced service layer is not required, provided care is taken during operations near the liner, and any damage to the liner is repaired.

## 3 INSTRUMENTATION

Instrumentation for the dam consists of piezometers, survey pins and inclinometers. Groundwater monitoring wells, upstream and downstream of the tailings facility, continue to be monitored.

Piezometers were installed in both the dam foundation and the damfill. In general, piezometric levels in the foundation are about 2 m below the foundation elevation. Piezometric levels in the dam fill are

about 2 m above the foundation level. Elevated groundwater levels in April, May and June are due to seasonal changes, and there appears to be a pattern to these fluctuations over the past 3 years. All water levels are within parameters required for stability (i.e. below “yellow trigger” levels defined in the OMS Manual), with the exception of a spike in pore water pressure reading in May and June, 2012 in PZ-10-03. This spike coincides with the beginning of fill placement for the Stage 2 Dam raise, and it is likely, given the subsequent drop off in water level, that the spike was due to a pore water response to initial fill placement. The piezometer data is presented in Appendix II.

Inclinometers were installed in the downstream slope of the dam. One inclinometer, IN-10-02, has not been functional since the Stage 2 construction. YZC is considering installation of alternate slope monitoring array technology in the inclinometer casing to re-establish monitoring this location. KCB has no objections to this approach. The inclinometer data has not indicated any significant slope movement. The inclinometer data is presented in Appendix III.

#### 4 CONCLUSIONS AND RECOMMENDATIONS

The tailings facility is performing as expected. The dam structure appears stable and no indicators of concerns were observed.

The main recommendations of this review include the following:

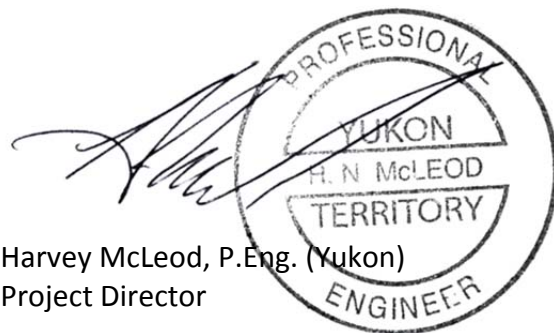
1. Continue to operate the facility as described in the Operation, Maintenance and Surveillance Manual V2010-01. In particular, complete a bathymetry of the tailings pond to confirm the volume of tailings currently being stored.
2. Grade crest at north end to minimize water infiltration into observed cracks, and recompact and close cracks. Inspect north end weekly to see if cracks have reopened.
3. Review water balance and finalize plan to construct water treatment plant.
4. Assess alternatives for relocating the reclaim barge and put a plan in place for this work.

Yours truly,

**KLOHN CRIPPEN BERGER LTD.**

Lowell Constable, P.Eng. (B.C.)  
Project Manager

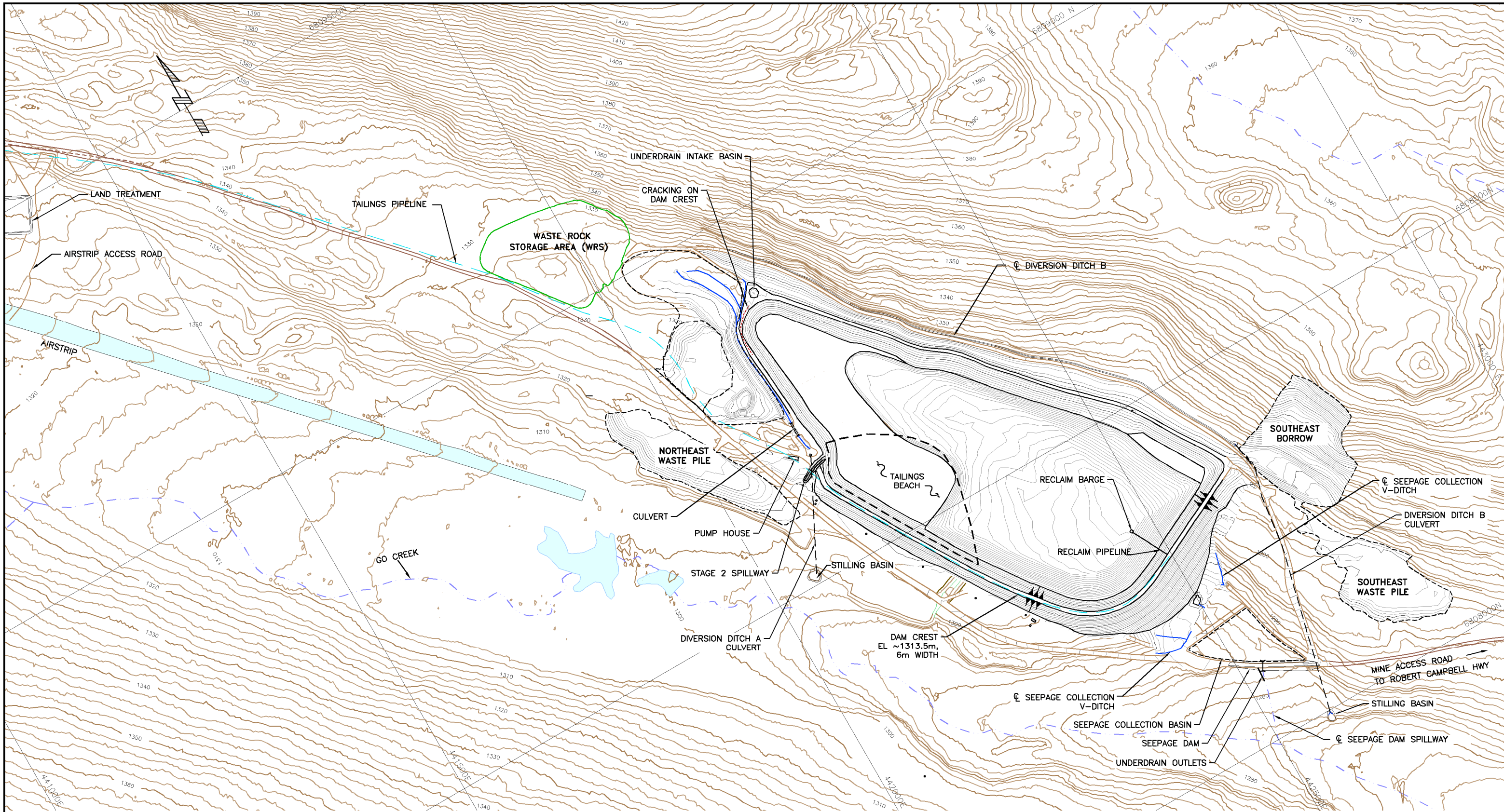
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Harvey McLeod, P.Eng. (Yukon)  
Project Director

Attachments: Figure 1 - Plan of 2011 Site Visit Observations  
Appendix I - Photo Record  
Appendix II - Piezometric Water Levels  
Appendix III – Inclinometer Readings





NOTES  
 1. NOT ALL CULVERTS HAVE BEEN SHOWN.  
 2. ALL ELEVATIONS IN METRES.

NOT FOR CONSTRUCTION



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

DWG. NO.	REFERENCE DRAWINGS

PROJECT	CIVIL	MECH.	STRUCT.	PIPING	SERVICES	ELECT.	INSUL.	NO	DESCRIPTION	BY	DATE

PROJECT	CIVIL	MECH.	STRUCT.	PIPING	SERVICES	ELECT.	INSUL.	NO	DESCRIPTION	BY	DATE

SECTION:	DATE
SCALE:	AUG 15/13
DESIGN BY: LC	AUG 15/13
DRAWN BY: OL	AUG 15/13
CHECK BY: HM	
APP. BY: HM	AUG 15/13

FILENAME:	PROJECT NUMBER	DRAWING NUMBER	REV.
	M09234A08	FIGURE 1	A



**Yukon Zinc Corporation**  
**WOLVERINE PROJECT**  
 2013 ANNUAL INSPECTION  
 TAILINGS STORAGE FACILITY PLAN

# APPENDIX I

## Photo Record

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## Appendix I Photo Record



**Photo 1**      **Dam crest**



**Photo 2**      **View from west side of impoundment, looking south**



**Photo 3**      **Minor cracking around reclaim line**





**Photo 4** Dam upstream face



**Photo 5** Tailings deposition in northwest corner





**Photo 6** Piezometer data collection box



**Photo 7** Impoundment from east abutment looking north



**Photo 8**      **Impoundment from north end looking south**



**Photo 9** Reclaim line damage to outer insulating pipe wall following dam raise construction





**Photo 10** Reclaim pump barge





**Photo 11** View of west dam downstream face, looking north



**Photo 12**      **Stage 2 spillway at dam crest**





**Photo 13** Stage 2 spillway channel, from dam crest



**Photo 14** Stage 2 spillway channel, from Mine Haul Road



**Photo 15**      **Cracks at north end of impoundment on crest**





**Photo 16** Cracks at North End of impoundment



**Photo 17** Seepage collection ditch at downstream toe of dam (no flow)



**Photo 18** Downstream dam face



**Photo 19** South downstream dam face





**Photo 20**      **View of Ditch A from culvert inlet**





**Photo 21** Ditch A culvert inlet partially blocked by coconut matting



**Photo 22**      **Ditch B –no flow**



**Photo 23**      **Ditch B – culvert inlet**





**Photo 24**      **Outlet from Ditch B culvert**



**Photo 25** Inlet to the underdrain – flow from upstream



**Photo 26** Underdrain Outlet – flow to Go Creek





**Photo 27** Seepage pond area from Tailings Dam



**Photo 28** Seepage pond area





**Photo 29** Seepage Return Pump



**Photo 30** Seepage dam spillway culvert inlets



**Photo 31**      **Waste Rock Stockpile**



**Photo 32**      **Waste Rock Stockpile – Diversion Ditch**



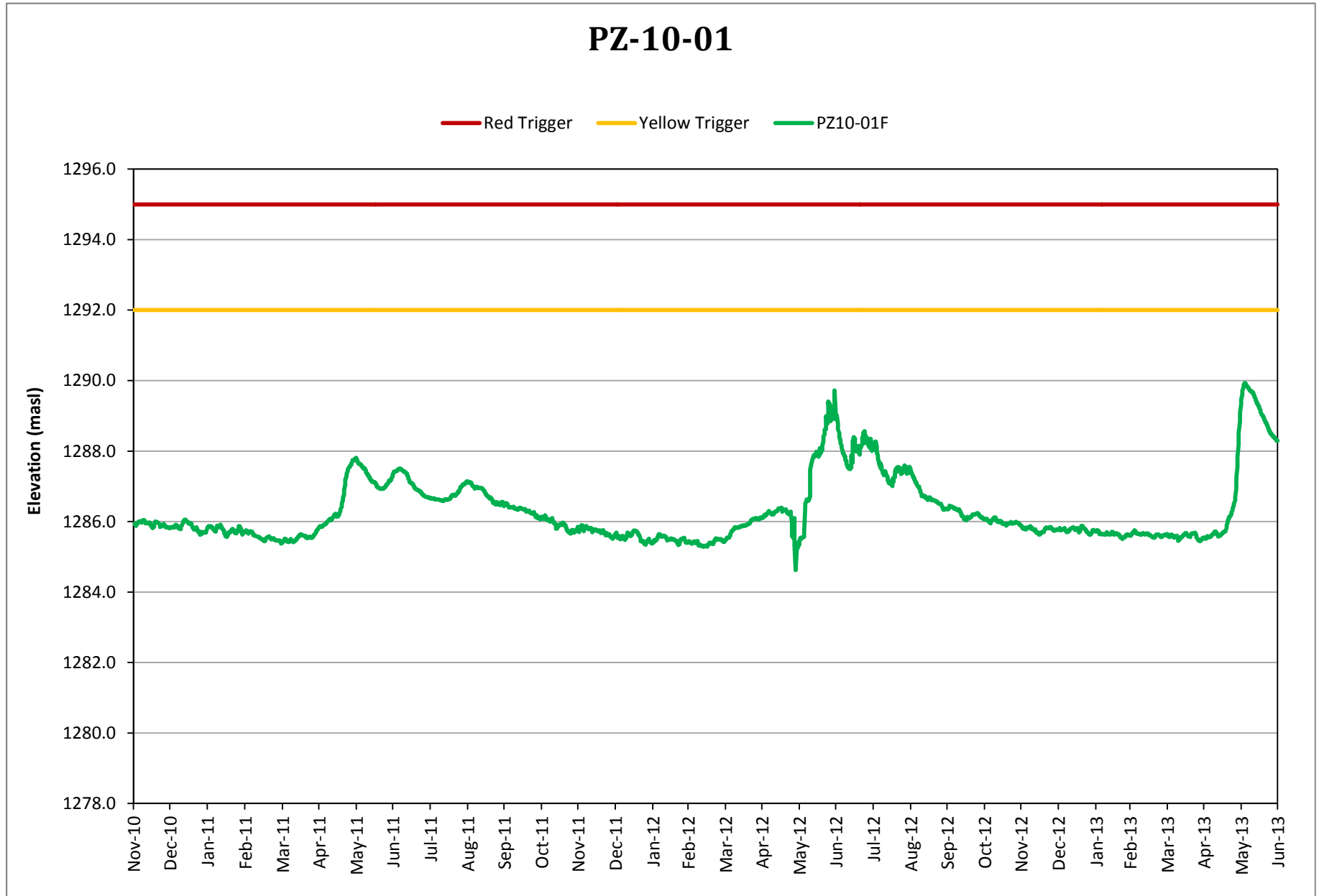


**Photo 33** Waste Rock Stockpile – Service layer washed out

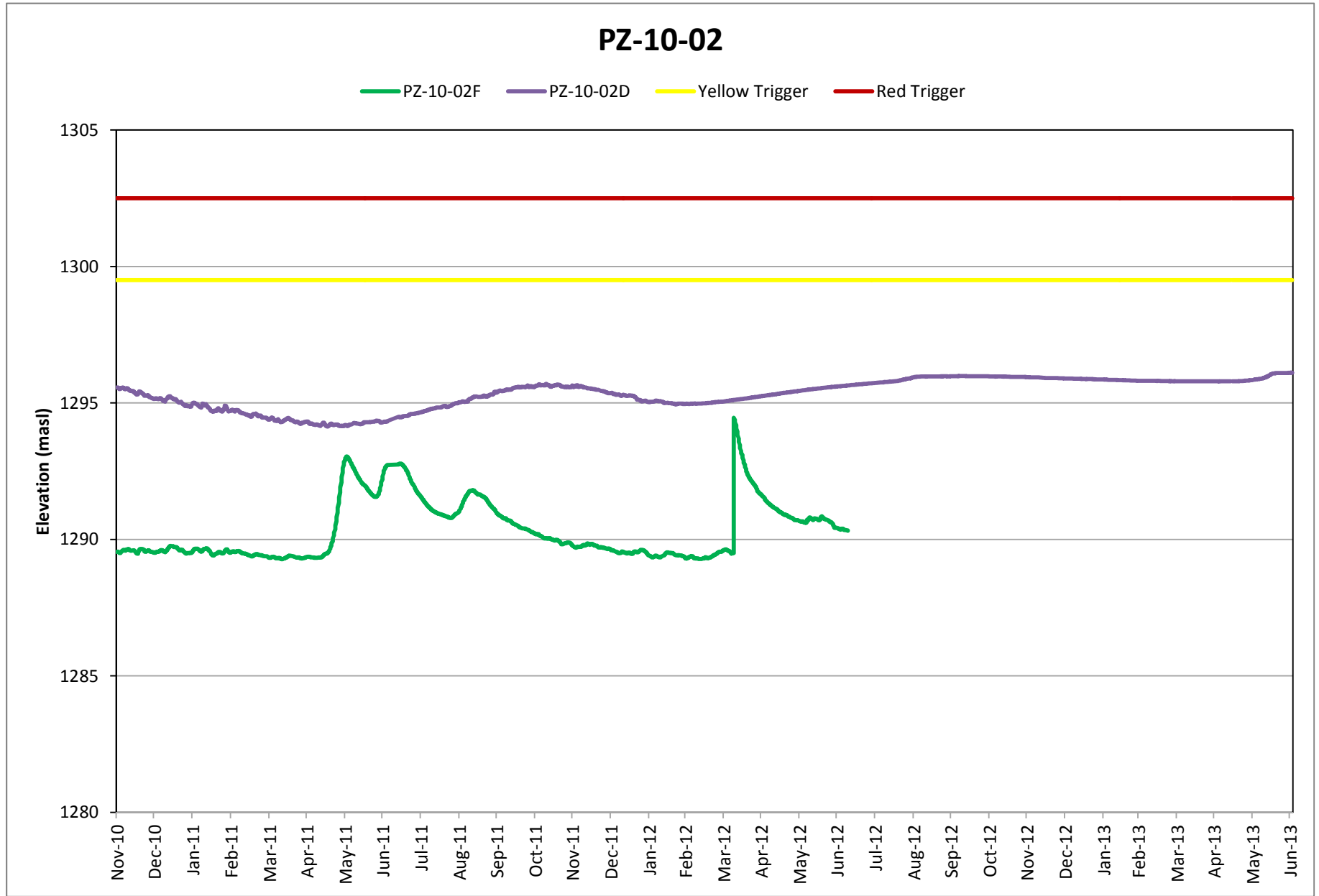
## **APPENDIX II**

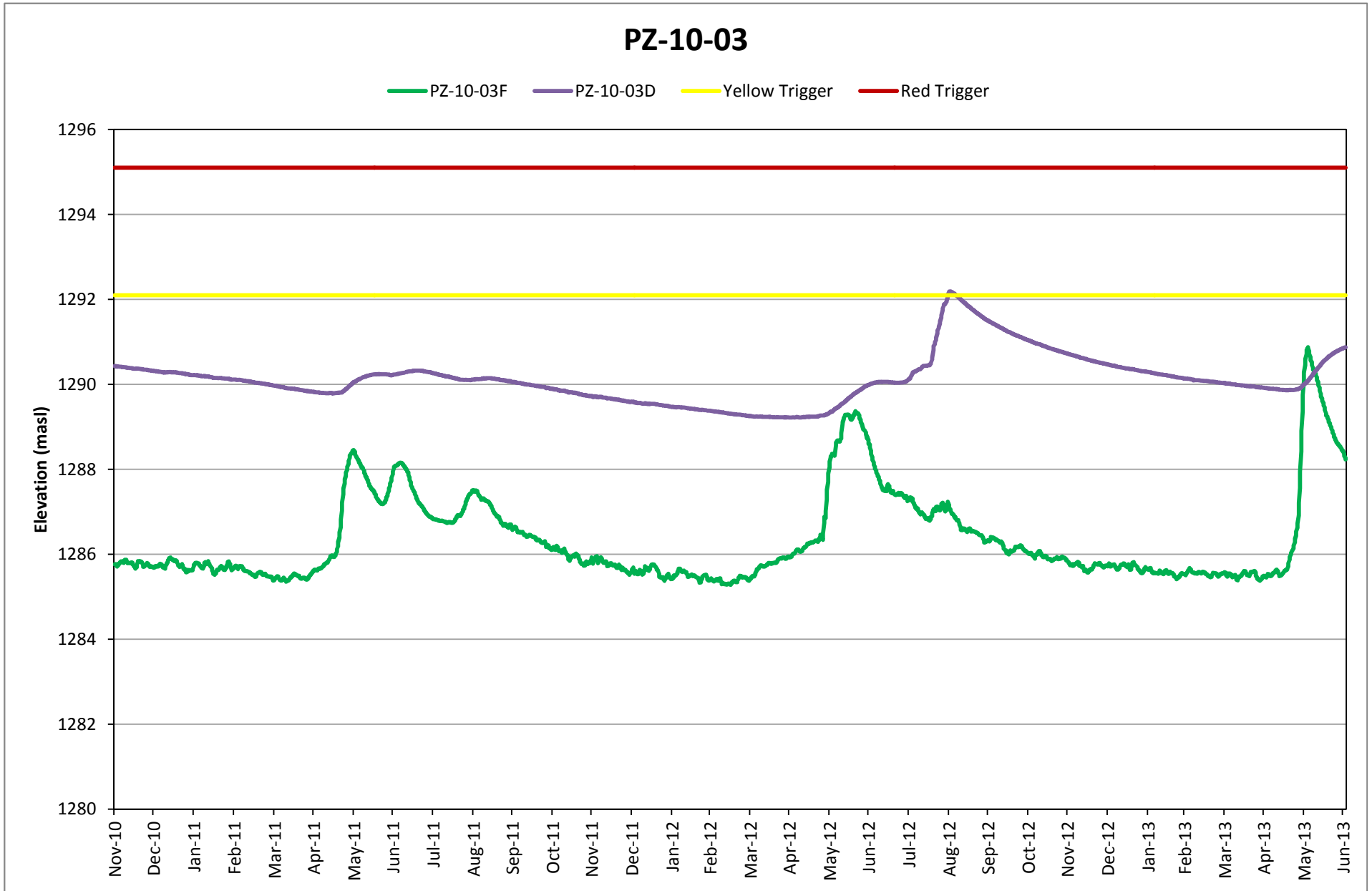
### **Piezometric Water Levels**

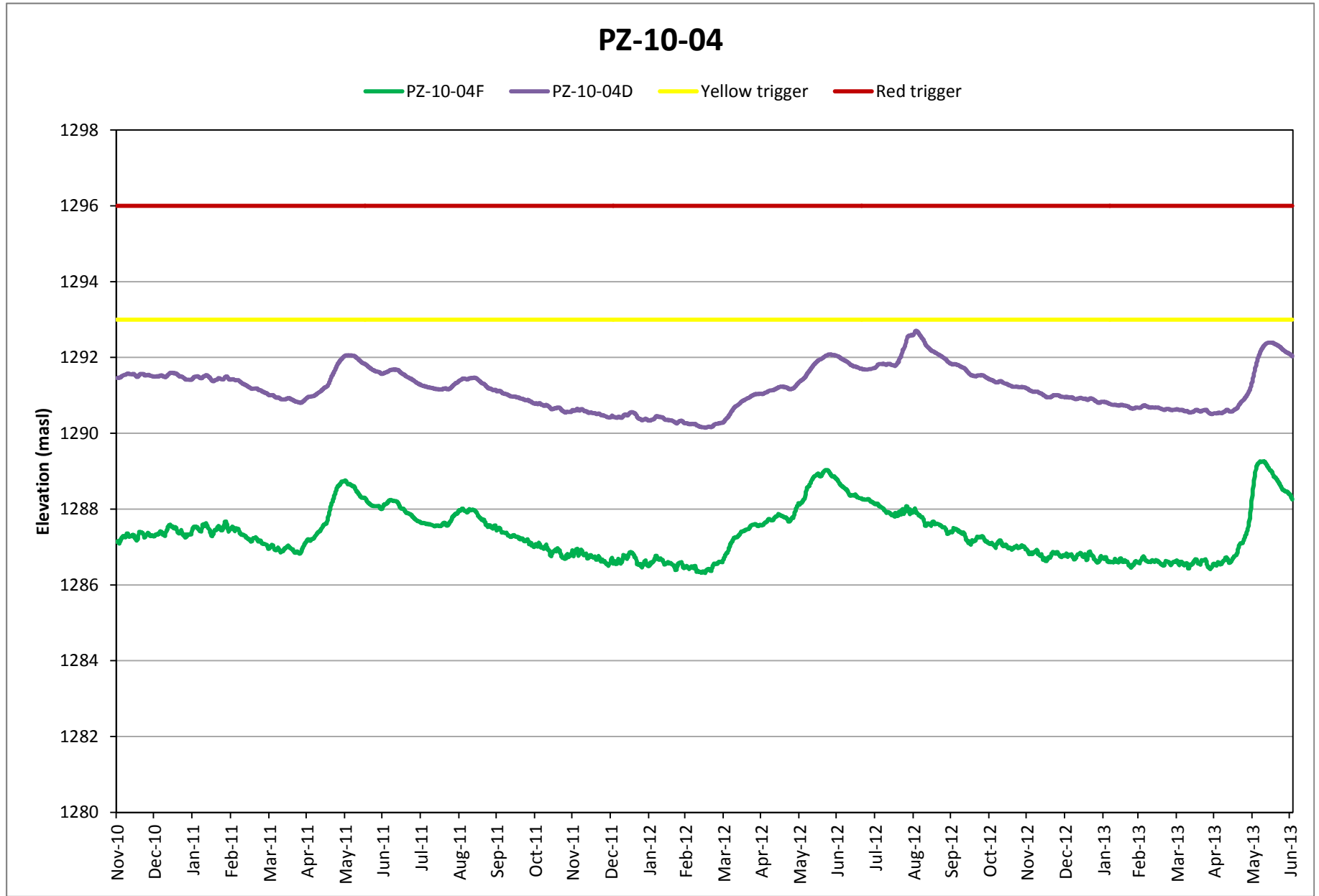
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## **APPENDIX III**

### **Inclinometer Readings**

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RST Digital Inclinometer Data					RST Digital Inclinometer Data					RST Digital Inclinometer Data					RST Digital Inclinometer Data				
File Version	2.2				File Version	2.2				File Version	2.2				File Version	2.2			
File Type	Digital Inclinometer				File Type	Digital Inclinometer				File Type	Digital Inclinometer				File Type	Digital Inclinometer			
Site	TAILINGS DAM				Site	TAILINGS DAM				Site	TAILINGS DAM				Site	TAILINGS DAM			
Borehole	IN10-01				Borehole	IN10-01				Borehole	IN10-01				Borehole	IN10-01			
Probe Serial#	DP06420000				Probe Serial#	DP06420000				Probe Serial#	DP06420000				Probe Serial#	DP06420000			
Reel Serial#	DR11930000				Reel Serial#	DR11930000				Reel Serial#	DR11930000				Reel Serial#	DR11930000			
Reading Date(m/d/y)	1/6/2011	10:18:26			Reading Date(m/d/y)	4/7/2011	11:58:38			Reading Date(m/d/y)	7/9/2011	10:16:53			Reading Date(m/d/y)	08/23/2012	7:35:36		
Depth	-13.5	-0.5			Depth	-13.5	-0.5			Depth	-13.5	-0.5			Depth	-25	-0.5		
Interval	0.5				Interval	0.5				Interval	0.5				Interval	0.5			
Depth Units	meters				Depth Units	meters				Depth Units	meters				Depth Units	meters			
Reading Units	meters				Reading Units	meters				Reading Units	meters				Reading Units	meters			
Operator					Operator					Operator					Operator				
Comment:					Comment:					Comment:					Comment:				
Comment End:					Comment End:					Comment End:					Comment End:				
Offset Correction	0				Offset Correction	0				Offset Correction	0				Offset Correction	0			
Depth	Face A+	Face A-	Face B+	Face B-	Depth	Face A+	Face A-	Face B+	Face B-	Depth	Face A+	Face A-	Face B+	Face B-	Depth	Face A+	Face A-	Face B+	Face B-
-0.5	0.03549719	-0.03484	-0.00044	0.00152	-0.5	-0.03277902	-0.00198	0.003351	-0.035486	-0.5	0.03684534	-0.00286189	-0.00157251	-0.035073	-0.5	0.2644787	-0.263826	-0.039963	0.040553
-1	0.02959396	-0.02889	-0.00355	0.004268	-1	-0.02575174	-0.00481	0.004691	-0.028627	-1	0.03064328	-0.00520407	-0.00421596	-0.02866	-1	0.2633183	-0.262579	-0.03975	0.040726
-1.5	0.01618515	-0.01617	-0.00122	0.002106	-1.5	-0.0112382	-0.00294	-0.00019	-0.0155	-1.5	0.01724242	-0.0023579	-0.00189857	-0.013927	-1.5	0.2465453	-0.245933	-0.036788	0.036972
-2	0.00541703	-0.00458	0.003651	-0.00324	-2	-0.00533758	0.003481	-0.00195	-0.005247	-2	0.00597843	0.00311221	0.00321947	-0.005267	-2	0.2209121	-0.220221	-0.033191	0.03314
-2.5	0.00774799	-0.00696	0.000624	-9.7E-05	-2.5	-0.00814819	0.000785	0.000941	-0.007312	-2.5	0.00788357	0.00051606	0.00062805	-0.007561	-2.5	0.2122052	-0.211373	-0.029576	0.030814
-3	0.0086958	-0.00791	-0.00137	0.001842	-3	-0.00773835	-0.00134	0.002234	-0.008194	-3	0.00885866	-0.00131236	-0.00145419	-0.00816	-3	0.2006788	-0.200079	-0.03033	0.030147
-3.5	0.00764286	-0.00674	-0.00203	0.002501	-3.5	-0.00670413	-0.00189	0.002492	-0.0071	-3.5	0.00775447	-0.00196087	-0.00209352	-0.007126	-3.5	0.1617234	-0.160807	-0.029086	0.02984
-4	0.00655298	-0.00574	-0.00189	0.002301	-4	-0.00555293	-0.00169	0.002166	-0.006036	-4	0.00669529	-0.00176738	-0.00183402	-0.005853	-4	0.1463327	-0.145789	-0.031244	0.03092
-4.5	0.00531532	-0.00469	-0.0016	0.00213	-4.5	-0.00404134	-0.00153	0.002406	-0.004693	-4.5	0.00548341	-0.0015107	-0.00163974	-0.004689	-4.5	0.1326445	-0.131769	-0.024853	0.024763
-5	0.00258903	-0.00175	-0.00163	0.002158	-5	-0.001607	-0.00149	0.002087	-0.001993	-5	0.00257662	-0.00157502	-0.00178374	-0.00192	-5	0.1184334	-0.118564	-0.020735	0.023881
-5.5	0.00117924	-0.00033	0.00018	0.000214	-5.5	-0.00020902	0.000338	-0.00072	-0.000606	-5.5	0.00253933	0.00024245	-0.00168629	-0.00055	-5.5	0.1168787	-0.115398	-0.023495	0.03661
-6	0.00067715	0.000149	0.002656	-0.00222	-6	0.00057452	0.002834	-0.00215	-6.36E-05	-6	0.00122692	0.00283278	0.00015837	-6E-05	-6	0.1595054	-0.15639	-0.049575	0.068024
-6.5	-0.00084669	0.001706	0.002741	-0.00232	-6.5	0.00198169	0.002824	-0.00266	0.001594	-6.5	0.00071888	0.0027921	0.00258431	0.001555	-6.5	0.1764502	-0.190842	-0.102417	0.078703
-7	-0.00157433	0.002307	0.004002	-0.00365	-7	0.00231279	0.004301	-0.0039	0.002178	-7	-0.00159324	0.00419577	0.00397	0.00213	-7	0.1799327	-0.189965	-0.098745	0.083569
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-8	-0.00450982	0.005366	0.003584	-0.00309	-8	0.00540544	0.004381	-0.00326	0.005389	-8	-0.00448922	0.00373999	0.00353981	0.00505	-8	0.1294781	-0.128295	-0.022684	0.022939
-8.5	-0.00488626	0.005681	0.004691	-0.00433	-8.5	0.00540274	0.005827	-0.00442	0.004745	-8.5	-0.0049078	0.00487652	0.00472243	0.005667	-8.5	0.12518	-0.124939	-0.018989	0.017547
-9	-0.00393315	0.00476	0.006089	-0.00573	-9	0.0045731	0.006287	-0.00583	0.004483	-9	-0.00395238	0.00618817	0.00598978	0.004568	-9	0.1026617	-0.101815	-0.010091	0.0112
-9.5	-0.00281408	0.003628	0.008076	-0.00766	-9.5	0.00365276	0.008317	-0.00766	0.003406	-9.5	-0.00283752	0.00814804	0.00801293	0.003721	-9.5	0.07582869	-0.075343	-0.016763	0.016985
-10	-0.0009548	0.000809	0.009516	-0.00918	-10	0.00078289	0.009845	-0.00916	0.0003	-10	-0.00026409	0.00976668	0.00946137	0.000409	-10	0.05201747	-0.050787	-0.012859	0.013022
-10.5	0.00121419	-0.00056	0.011221	-0.0109	-10.5	-0.00049003	0.011462	-0.01082	-0.000378	-10.5	0.00118301	0.01144902	0.01123339	-0.000504	-10.5	0.03917777	-0.038715	-0.006355	0.006333
-11	0.00156495	-0.00056	0.011484	-0.0111	-11	-0.00049439	0.011651	-0.01117	-0.000804	-11	0.00144067	0.01168861	0.01156014	-0.000847	-11	0.02611825	-0.024688	0.004313	-0.00392
-11.5	0.00230779	-0.00159	0.011545	-0.01125	-11.5	-0.00159868	0.011829	-0.01131	-0.001761	-11.5	0.00222801	0.01179569	0.01154338	-0.001705	-11.5	0.01356231	-0.012698	0.012426	-0.01232
-12	0.00392225	-0.00306	0.011152	-0.01074	-12	-0.00305542	0.011248	-0.01076	-0.003291	-12	0.00387195	0.01132225	0.01114401	-0.003207	-12	0.01275911	-0.01201	0.012017	-0.01143
-12.5	0.00439624	-0.00357	0.010235	-0.0098	-12.5	-0.00356452	0.010227	-0.00982	-0.00364	-12.5	0.00435088	0.01040505	0.01022866	-0.003738	-12.5	0.00047152	0.000677	0.011897	-0.01163
-13	0.00464138	-0.00376	0.009978	-0.00954	-13	-0.00386496	0.01018	-0.0094	-0.003953	-13	0.00459494	0.01015973	0.00996239	-0.003971	-13	0.00716074	-0.006374	0.009068	-0.00867
-13.5	0.00466299	-0.00382	0.010171	-0.0097	-13.5	-0.00382475	0.010339	-0.00973	-0.004122	-13.5	0.00465565	0.01031684	0.01016845	-0.004066	-13.5	0.0303039	-0.029183	0.008676	-0.0083
															-14	0.01176959	-0.01108	0.007523	-0.00711
															-14.5	0.00936354	-0.008284	0.002143	-0.00199
															-15	0.01214896	-0.011392	-0.000764	0.001066
															-15.5	0.01015355	-0.009276	-0.002292	0.002669
															-16	0.00785714	-0.006854	-0.001926	0.002217
															-16.5	0.00584126	-0.005167	-0.000368	0.001077
															-17	0.00393498	-0.002754	-0.002754	0.002709
															-17.5	0.00299441	-0.002143	-0.000879	0.001122
															-18	0.00385332	-0.00305	0.005277	-0.00516
															-18.5	0.00299624	-0.002034	0.001925	-0.00169
															-19	-0.00100475	0.001857	-0.001246	0.00157
															-19.5	-0.00052736	0.000932	0.00424	-0.00378
															-20	-0.00316181	0.004446	0.001631	-0.00168
															-20.5	-0.00316575	0.005911	0.001626	-0.00323
															-21	-0.00502883	0.004321	0.003465	-0.00475
															-21.5	-0.00358821	0.004049	0.004964	-0.0078
															-22	-0.00311866	0.001226	0.008003	-0.00857
															-22.5	-0.00038444	-0.000311	0.008797	-0.01113
															-23	0.00119653	-0.000594	0.011276	-0.01147
															-23.5	0.00146504	-0.0018	0.011724	-0.01123
															-24	0.0025807	-0.003213	0.011339	-0.01071
															-24.5	0.00470021	-0.003744	0.010135	-0.00993
															-25	0.00478425	-0.003901	0.009792	-0.00946

RST Digital Inclinometer Data					RST Digital Inclinometer Data					RST Digital Inclinometer Data					RST Digital Inclinometer Data					RST Digital Inclinometer Data				
File Version	2.2				File Version	2.2				File Version	2.2				File Version	2.2				File Version	2.2			
File Type	Digital Inclinometer				File Type	Digital Inclinometer				File Type	Digital Inclinometer				File Type	Digital Inclinometer				File Type	Digital Inclinometer			
Site	TAILINGS DAM				Site	TAILINGS DAM				Site	TAILINGS DAM				Site	TAILINGS DAM				Site	TAILINGS DAM			
Borehole	IN10-01				Borehole	IN10-01				Borehole	IN10-01				Borehole	IN10-01				Borehole	IN10-01			
Probe Serial#	DP06420000				Probe Serial#	DP06420000				Probe Serial#	DP06420000				Probe Serial#	DP06420000				Probe Serial#	DP06420000			
Reel Serial#	DR11930000				Reel Serial#	DR11930000				Reel Serial#	DR11930000				Reel Serial#	DR11930000				Reel Serial#	DR11930000			
Reading Date(m/d/y)	10/13/2012		11:33:16		Reading Date(m/d/y)	12/12/2012		15:31:56		Reading Date(m/d/y)	01/16/2013		17:08:05		Reading Date(m/d/y)	05/13/2013		15:18:45		Reading Date(m/d/y)	06/30/2013		16:16:19	
Depth	-25		-0.5		Depth	-25		-0.5		Depth	-25		-0.5		Depth	-25		-0.5		Depth	-25		-0.5	
Interval	0.5				Interval	0.5				Interval	0.5				Interval	0.5				Interval	0.5			
Depth Units	meters				Depth Units	meters				Depth Units	meters				Depth Units	meters				Depth Units	meters			
Reading Units	meters				Reading Units	meters				Reading Units	meters				Reading Units	meters				Reading Units	meters			
Operator					Operator					Operator					Operator					Operator				
Comment:					Comment:					Comment:					Comment:					Comment:				
Comment End:					Comment End:					Comment End:					Comment End:					Comment End:				
Offset Correction	0				Offset Correction	0				Offset Correction	0				Offset Correction	0				Offset Correction	0			
Depth	Face A+	Face A-	Face B+	Face B-	Depth	Face A+	Face A-	Face B+	Face B-	Depth	Face A+	Face A-	Face B+	Face B-	Depth	Face A+	Face A-	Face B+	Face B-	Depth	Face A+	Face A-	Face B+	Face B-
-0.5	0.2752143	-0.2746643	-0.039348	0.040008	-0.5	0.2755904	-0.27506	-0.0388	0.039668	-0.5	-0.2747057	0.040985	0.038494	0.269764	-0.5	0.3123006	-0.30587	-0.03343	0.034095	-0.5	0.3134685	-0.30588	-0.03303	0.03359
-1	0.2697984	-0.2691209	-0.039524	0.040141	-1	0.2698145	-0.26911	-0.03915	0.039848	-1	-0.2690597	0.044073	0.038836	0.264627	-1	0.2850564	-0.28433	-0.03164	0.032194	-1	0.3127659	-0.30543	-0.03241	0.032935
-1.5	0.246401	-0.2455954	-0.036283	0.036972	-1.5	0.2465341	-0.24567	-0.03575	0.036865	-1.5	-0.2455629	0.028221	0.036679	0.246425	-1.5	0.2371694	-0.23635	-0.02759	0.028174	-1.5	0.2863542	-0.30586	-0.0315	0.032776
-2	0.2206132	-0.2199429	-0.032967	0.032842	-2	0.2206083	-0.21988	-0.03257	0.032724	-2	-0.2197203	0.032891	0.032518	0.220377	-2	0.230039	-0.22915	-0.02625	0.027476	-2	0.2373708	-0.28544	-0.02746	0.031479
-2.5	0.212056	-0.2111975	-0.029478	0.030586	-2.5	0.2120381	-0.21112	-0.02922	0.030507	-2.5	-0.2110544	0.030549	0.029973	0.211674	-2.5	0.2107186	-0.20996	-0.02993	0.029864	-2.5	0.2301815	-0.23642	-0.02599	0.027866
-3	0.2003444	-0.1997859	-0.030184	0.029976	-3	0.2004098	-0.19978	-0.02987	0.029875	-3	-0.1996874	0.025119	0.029645	0.2001	-3	0.1630027	-0.16202	-0.02938	0.030261	-3	0.2119958	-0.22937	-0.02999	0.026749
-3.5	0.1609747	-0.1599877	-0.028984	0.02965	-3.5	0.1610645	-0.16002	-0.02874	0.029554	-3.5	-0.160015	0.026486	0.029157	0.160027	-3.5	0.1461772	-0.14542	-0.03063	0.030696	-3.5	0.1664463	-0.21122	-0.03034	0.029597
-4	0.1459556	-0.1453721	-0.031193	0.030893	-4	0.1459559	-0.14534	-0.03093	0.030759	-4	-0.1452963	0.030556	0.030412	0.146177	-4	0.1315055	-0.1305	-0.02402	0.024233	-4	0.1463614	-0.16536	-0.03065	0.030994
-4.5	0.1317569	-0.1309067	-0.024898	0.024785	-4.5	0.1317757	-0.13084	-0.02463	0.024686	-4.5	-0.1308149	0.021858	0.02454	0.133501	-4.5	0.1176289	-0.11655	-0.0211	0.018704	-4.5	0.1320006	-0.14564	-0.02329	0.030398
-5	0.1178318	-0.116734	-0.020407	0.019236	-5	0.11775	-0.11664	-0.02053	0.019065	-5	-0.1165468	0.01907	0.018817	0.117315	-5	0.1164255	-0.11531	-0.02378	0.034132	-5	0.1131607	-0.13081	-0.02028	0.023927
-5.5	0.1164481	-0.1151595	-0.023417	0.035568	-5.5	0.1163676	-0.11531	-0.02329	0.033833	-5.5	-0.1152385	0.021086	0.033614	0.115319	-5.5	0.1597193	-0.16448	-0.05049	0.040986	-5.5	0.1188887	-0.11209	-0.02135	0.018104
-6	0.1594478	-0.162186	-0.049914	0.054171	-6	0.159243	-0.15779	-0.0497	0.067321	-6	-0.1578438	0.033601	0.066328	0.160047	-6	0.1751916	-0.18194	-0.10273	0.092221	-6	0.1568623	-0.11873	-0.04663	0.026818
-6.5	0.1774905	-0.2033967	-0.10052	-0.034464	-6.5	0.1757541	-0.18214	-0.10227	0.093089	-6.5	-0.1820744	0.09692	0.092886	0.182581	-6.5	0.1790719	-0.18452	-0.0995	0.090649	-6.5	0.1799125	-0.15223	-0.10612	0.066317
-7	0.1817839	-0.2039681	-0.096524	-0.036871	-7	0.180082	-0.18476	-0.09841	0.090477	-7	-0.1846705	0.08784	0.090327	0.186341	-7	0.1602831	-0.18084	-0.08964	0.072247	-7	0.1834098	-0.19332	-0.09937	0.084622
-7.5	0.1620275	-0.182353	-0.086747	-0.041036	-7.5	0.1649474	-0.17038	-0.08255	0.082547	-7.5	-0.1701308	0.06539	0.083059	0.175514	-7.5	0.1290455	-0.12955	-0.02191	0.009256	-7.5	0.1635515	-0.19041	-0.08594	0.086846
-8	0.1290407	-0.1077177	-0.022496	-0.073929	-8	0.1290487	-0.1278	-0.02228	0.022729	-8	-0.1277462	0.08391	0.022421	0.097012	-8	0.1246092	-0.12493	-0.01808	0.009254	-8	0.1290921	-0.17708	-0.02204	0.060094
-8.5	0.1248607	-0.1018491	-0.018582	-0.071745	-8.5	0.1248695	-0.12443	-0.01834	0.017523	-8.5	-0.1243025	0.080217	0.017519	0.093319	-8.5	0.1020781	-0.10171	-0.00959	0.001166	-8.5	0.1243872	-0.12855	-0.01792	0.018195
-9	0.1023163	-0.08016751	-0.009889	-0.059137	-9	0.1023069	-0.10137	-0.00972	0.011011	-9	-0.1012815	0.062687	0.010736	0.079257	-9	0.075543	-0.07629	-0.01644	0.006645	-9	0.1018924	-0.12452	-0.00952	0.011411
-9.5	0.0757592	-0.0654823	-0.016674	-0.040138	-9.5	0.07576249	-0.07512	-0.01658	0.017131	-9.5	-0.07501658	0.054749	0.016799	0.057276	-9.5	0.05151587	-0.05136	-0.01253	0.007312	-9.5	0.0746281	-0.07524	-0.0166	0.008396
-10	0.05167773	-0.04495163	-0.012882	-0.026054	-10	0.05169173	-0.05045	-0.0127	0.012924	-10	-0.05068864	0.039857	0.011576	0.033422	-10	0.03906313	-0.0387	-0.00615	0.00255	-10	0.05199935	-0.05171	-0.01239	0.007021
-10.5	0.03911767	-0.03168496	-0.006322	-0.022194	-10.5	0.0391255	-0.03876	-0.00622	0.00647	-10.5	-0.0386754	0.028244	0.004999	0.025424	-10.5	0.02643885	-0.02461	-0.00378	-0.00642	-10.5	0.03855023	-0.03807	-0.00623	0.003248
-11	0.0264947	-0.01499224	0.004023	-0.021126	-11	0.02751558	-0.02508	-0.005527	-0.00355	-11	-0.0248375	0.012725	-0.00531	0.020188	-11	0.01367902	-0.01134	-0.013218	-0.01447	-11	0.0266954	-0.02468	-0.004027	-0.00597
-11.5	0.0132948	0.00059391	0.013064	-0.020298	-11.5	0.01407925	-0.01228	0.010814	-0.01342	-11.5	-0.01145374	-0.00195	-0.01407	0.018777	-11.5	0.01589696	-0.01475	0.004288	-0.00748	-11.5	0.01362362	-0.01147	0.013302	-0.01473
-12	0.014659	-0.003326	0.00761	-0.013981	-12	0.01574583	-0.01478	0.002468	-0.00447	-12	-0.01466133	4.77E-06	-0.00606	0.015083	-12	0.00033541	0.000713	0.011784	-0.01177	-12	0.01551001	-0.01282	0.006795	-0.01398
-12.5	0.00047542	0.00736893	0.011809	-0.013164	-12.5	0.00053365	0.00052	0.011822	-0.01171	-12.5	0.00058014	-0.00882	-0.0118	0.005172	-12.5	0.00744681	-0.0068	0.009133	-0.00876	-12.5	0.0002722	0.000744	0.01174	-0.01183
-13	0.00733418	-0.00019985	0.009133	-0.018187	-13	0.0073806	-0.0068	0.00925	-0.00862	-13	-0.00672237	-0.00264	-0.00878	0.017079	-13	0.03034867	-0.0292	0.008898	-0.00872	-13	0.00791012	-0.00717	0.008984	-0.00873
-13.5	0.03054328	-0.01936674	0.008947	-0.017901	-13.5	0.03056208	-0.02927	0.009029	-0.00847	-13.5	-0.02924207	0.012204	-0.00866	0.017949	-13.5	0.01147107	-0.01048	0.007553	-0.00708	-13.5	0.0305856	-0.02922	0.008931	-0.00881
-14	0.01154883	-0.00496349	0.007529	-0.009347	-14	0.01145513	-0.01073	0.007685	-0.00691	-14	-0.0107065	0.001639	-0.00695	0.007301	-14	0.00989301	-0.00874	0.002208	-0.00219	-14	0.01117991	-0.01016	0.007309	-0.00705
-14.5	0.0098576	-0.00602936	0.002195	-0.00703	-14.5	0.0098954	-0.00876	0.002294	-0.00208	-14.5	-0.00870244	0.004903	-0.00218	0.005323	-14.5	0.01292685	-0.012	-0.00878	0.001038	-14.5	0.01005019	-0.00891	0.002061	-0.00215
-15	0.01281938	-0.01045248	-0.000754	-0.005699	-15	0.01288376	-0.0121	-0.00067	0.001082	-15	-0.01199197	0.009238	0.001045	0.004237	-15	0.01079804	-0.00981	-0.00234	0.002566	-15	0.01295136	-0.01199	-0.00094	0.001034
-15.5	0.01063861	-0.00938956	-0.002328	-0.004553	-15.5	0.01073813	-0.00986	-0.00225	0.002719	-15.5	-0.00979581	0.008933	0.002601	0.003167	-15.5	0.00837873	-0.00736	-0.00182	0.002035	-15.5	0.01080407	-0.00976	-0.00246	0.002511
-16	0.00820223	-0.00715076	-0.001878	-0.004166	-16	0.00832087	-0.00738	-0.00174	0.002178	-16	-0.00734973	0.007011	0.002088	0.002411	-16	0.00615663	-0.00534	-0.00027	0.000776	-16	0.0083654	-0.00734	-0.0019	0.00192
-16.5	0.0060638	-0.00430063	-0.000251	-0.003061	-16.5	0.00610964	-0.00543	-0.00017	0.000895	-16.5	-0.00537731	0.004781	0.000806	0.000565	-16.5	0.00433742	-0.00365	-0.0025	0.00273	-16.5	0.006365	-0.00561	-0.00074	0.00076
-17	0.00464786	-0.00460134	-0.00273	-0.003679	-17	0.00470966	-0.00358	-0.00267	0.002832	-17	-0.00358829	0.004867	0.002745	0.002499	-17	0.00405512	-0.00304	-0.00072	0.000931	-17	0.00455783	-0		



RST Digital Inclinator Data					RST Digital Inclinator Data					RST Digital Inclinator Data					RST Digital Inclinator Data				
File Version	2.2				File Version	2.2				File Version	2.2				File Version	2.2			
File Type	Digital Inclinator				File Type	Digital Inclinator				File Type	Digital Inclinator				File Type	Digital Inclinator			
Site	TAILINGS DAM				Site	TAILINGS DAM				Site	TAILINGS DAM				Site	TAILINGS DAM			
Borehole	IN10-02				Borehole	IN10-02				Borehole	IN10-02				Borehole	IN10-02			
Probe Serial#	DP06420000				Probe Serial#	DP06420000				Probe Serial#	DP06420000				Probe Serial#	DP06420000			
Reel Serial#	DR11930000				Reel Serial#	DR11930000				Reel Serial#	DR11930000				Reel Serial#	DR11930000			
Reading Date(m/d/y)	1/6/2011		10:03:28		Reading Date(m/d/y)	4/7/2011		11:48:07		Reading Date(m/d/y)	7/9/2011		10:06:07		Reading Date(m/d/y)	08/23/2012		7:05:31	
Depth	-15		-0.5		Depth	-15		-0.5		Depth	-15		-0.5		Depth	-10		-0.5	
Interval	0.5				Interval	0.5				Interval	0.5				Interval	0.5			
Depth Units	meters				Depth Units	meters				Depth Units	meters				Depth Units	meters			
Reading Units	meters				Reading Units	meters				Reading Units	meters				Reading Units	meters			
Operator					Operator					Operator					Operator				
Comment:					Comment:					Comment:					Comment:				
Comment End:					Comment End:					Comment End:					Comment End:				
Offset Correction	0				Offset Correction	0				Offset Correction	0				Offset Correction	0			
Depth	Face A+	Face A-	Face B+	Face B-	Depth	Face A+	Face A-	Face B+	Face B-	Depth	Face A+	Face A-	Face B+	Face B-	Depth	Face A+	Face A-	Face B+	Face B-
-0.5	-0.00241169	0.00339	0.012339	-0.01178	-0.5	-0.00430749	-0.01208	0.012651	-0.00355	-0.5	-0.00583816	0.01547	0.015933	0.006279	-0.5	0.232192	-0.23202	-0.0643	0.06463
-1	-0.00331789	0.00395	0.011984	-0.01171	-1	-0.00350436	-0.01214	0.01237	-0.0033	-1	-0.00397576	0.013508	0.013503	0.00414	-1	0.2264163	-0.22604	-0.06431	0.063976
-1.5	-0.00448572	0.005258	0.013	-0.01267	-1.5	-0.00422151	-0.01271	0.013299	-0.00437	-1.5	-0.00429449	0.013697	0.013546	0.004745	-1.5	0.2140903	-0.21451	-0.06254	0.057037
-2	-0.00450316	0.005319	0.01968	-0.0191	-2	-0.00442568	-0.01897	0.01957	-0.00441	-2	-0.00451677	0.019654	0.019654	0.004962	-2	0.2121653	-0.21149	-0.05838	0.05432
-2.5	-0.0049488	0.005726	0.020258	-0.01993	-2.5	-0.00491237	-0.01965	0.020147	-0.00493	-2.5	-0.00494129	0.020477	0.020241	0.005576	-2.5	0.2069767	-0.20709	-0.06059	0.055155
-3	-0.00472657	0.005486	0.018574	-0.01806	-3	-0.00493752	-0.0178	0.020192	-0.00473	-3	-0.00470458	0.018617	0.018491	0.005343	-3	0.2190463	-0.21909	-0.05911	0.053756
-3.5	-0.00468653	0.005496	0.017723	-0.0172	-3.5	-0.00470375	-0.0171	0.017642	-0.00459	-3.5	-0.00475943	0.01796	0.017667	0.005297	-3.5	0.223327	-0.22393	-0.05816	0.04963
-4	-0.0044427	0.005182	0.016886	-0.01651	-4	-0.0044219	-0.01639	0.01682	-0.00442	-4	-0.00442861	0.017143	0.016834	0.00501	-4	0.213751	-0.21445	-0.054	0.044587
-4.5	-0.00413776	0.004996	0.015851	-0.01544	-4.5	-0.00413384	-0.01517	0.015804	-0.0044	-4.5	-0.00415501	0.01611	0.015818	0.00478	-4.5	0.1902593	-0.19018	-0.05307	0.045204
-5	-0.00438674	0.005193	0.014844	-0.01436	-5	-0.00430256	-0.01417	0.01479	-0.00454	-5	-0.00431741	0.01495	0.014809	0.004858	-5	0.1828448	-0.18171	-0.04406	0.052472
-5.5	-0.00583168	0.006544	0.014453	-0.01414	-5.5	-0.00582394	-0.01397	0.014417	-0.00585	-5.5	-0.00584656	0.014639	0.014422	0.006213	-5.5	0.2288324	-0.23771	-0.09783	0.071135
-6	-0.00798527	0.008828	0.013692	-0.01331	-6	-0.00796657	-0.01303	0.013643	-0.00818	-6	-0.00799013	0.013806	0.013674	0.008579	-6	0.2110338	-0.2105	-0.08871	0.088119
-6.5	-0.01134704	0.012209	0.012422	-0.01198	-6.5	-0.01132138	-0.01178	0.012361	-0.01155	-6.5	-0.01132635	0.01256	0.012344	0.011955	-6.5	0.1585943	-0.16082	-0.0892	0.084839
-7	-0.01363224	0.01437	0.011833	-0.01155	-7	-0.01352065	-0.01131	0.011864	-0.0137	-7	-0.01362349	0.012029	0.011807	0.014235	-7	0.1458759	-0.15403	-0.10424	0.089525
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-8	-0.01342628	0.014313	0.010543	-0.01006	-8	-0.01340649	-0.00984	0.010472	-0.01372	-8	-0.01340985	0.010699	0.010502	0.014147	-8	0.1406154	-0.1461	-0.08429	0.070897
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-9	-0.01247086	0.013123	0.015301	-0.01495	-9	-0.01245778	-0.01479	0.015227	-0.0126	-9	-0.01247553	0.01548	0.015275	0.012803	-9	0.08783096	-0.09284	-0.06686	0.057275
-9.5	-0.01177471	0.012649	0.015469	-0.01505	-9.5	-0.0117772	-0.01484	0.015371	-0.01203	-9.5	-0.01181073	0.015689	0.015401	0.012453	-9.5	0.06829032	-0.07456	-0.06248	0.048961
-10	-0.01153688	0.012227	0.015021	-0.0147	-10	-0.01152348	-0.01465	0.014951	-0.01146	-10	-0.01152749	0.015339	0.015014	0.012089	-10	0.06730075	-0.0706	-0.04489	0.034831
-10.5	-0.01136489	0.012251	0.014413	-0.01405	-10.5	-0.01133007	-0.01363	0.014323	-0.01139	-10.5	-0.01136118	0.014666	0.014408	0.012025					
-11	-0.01136445	0.01221	0.013034	-0.01268	-11	-0.01135688	-0.01254	0.012959	-0.0113	-11	-0.01137858	0.013327	0.013031	0.011961					
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-12	-0.01153112	0.011879	0.011656	-0.01109	-12	-0.0115187	-0.01101	0.011576	-0.01128	-12	-0.01152937	0.011801	0.011655	0.012063					
-12.5	-0.01161823	0.01258	0.009093	-0.00876	-12.5	-0.01161698	-0.0085	0.00899	-0.012	-12.5	-0.01161279	0.009198	0.009058	0.01236					
-13	-0.01222567	0.012898	0.008163	-0.00785	-13	-0.01220954	-0.0077	0.008086	-0.01225	-13	-0.01221634	0.00842	0.008169	0.012775					
-13.5	-0.0119145	0.01277	0.007604	-0.00723	-13.5	-0.01193501	-0.00698	0.007492	-0.01217	-13.5	-0.01193456	0.007806	0.007576	0.012628					
-14	-0.01205993	0.01293	0.007243	-0.00684	-14	-0.01206166	-0.00667	0.007146	-0.01219	-14	-0.01207351	0.007361	0.007224	0.012673					
-14.5	-0.01179441	0.012547	0.007123	-0.00678	-14.5	-0.01184492	-0.00654	0.006959	-0.012	-14.5	-0.01184668	0.007411	0.007044	0.012334					
-15	0	0.012556	0	-0.00673	-15	-0.01175278	-0.00656	0.007094	-0.01185	-15	-0.01178733	0.007347	0.007148	0.012286					