SONA RESOURCES CORPORATION
BLACKDOME MINE TAILINGS STORAGE FACILITY



REPORT ON 2014 ANNUAL INSPECTION

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SONA RESOURCES CORPORATION
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TAILINGS STORAGE FACILITY

REPORT ON 2014 ANNUAL INSPECTION
VA101-70/15-1

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EXECUTIVE SUMMARY

Blackdome Mine is an underground gold mine located approximately 70 km northwest of Clinton, British Columbia. The mine has been operating on a care and maintenance basis since operations were suspended in May of 1999. Mine tailings are stored in a Tailings Storage Facility (TSF), which was designed and constructed in four stages. Each stage was designed by a different engineering consultant as follows:

- Stage 1 designed by Reimchen Urlich Geological Engineering in 1985
- Stage 2 designed by Robinson Dames and Moore in 1987
- Stage 3 designed by SRK-Robinson Inc in 1988, and
- Stage 4 designed by Knight Piésold Ltd. in 1998.

Sona Resources Corporation commissioned Knight Piésold Ltd. to complete the 2014 Dam Safety Inspection (DSI) of the TSF. Les Galbraith, P.Eng., of Knight Piésold Ltd., visited the site on October 9, 2014 and completed the DSI in the company of Nick Ferris, Executive Chairman of Sona Resources. The 2014 inspection involved visual observations of the TSF and surrounding surface runoff diversion works, as well as obtaining water level readings from piezometers and flow measurements from weirs.

A summary of the 2014 DSI is as follows:

- The crest elevation of the TSF is approximately 1828.4 m. The TSF embankment is approximately 36 m high, as measured from the embankment crest to the downstream toe.
- The TSF has a “Significant” dam classification according to the 2014 Canadian Dam Association (CDA) – Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams.
- There have been no changes to the TSF or surrounding conditions since the previous inspection in 2013.
- There have been no significant visual changes to the dam since the previous inspection. No signs of deformation were identified on the tailings embankment. The embankment slopes were approximately planar and there was no evidence of cracking, bulging, or slumping in the embankment fill materials. The embankment crest also appeared to be relatively level with no signs of differential settlement.
- Water management is the main consideration for environmental protection at the site. The fundamental water management objectives for the TSF during the care and maintenance period are to keep the tailings pond as low as possible. This is successfully being achieved by the TSF spillway and by diverting water from the 1870 portal around the TSF via the South Diversion Ditch and by diverting water from the 1920 portal around the tailings facility via a ditch on the access road to the 1920 portal.
- The Stage 4 design of the TSF included a minimum freeboard of 1.3 m above the spillway invert elevation to provide for safe passage of the 1 in 200 year 24-hour storm event and to provide an additional 1.0 m of contingency freeboard for protection against overtopping and wave action. The current pond elevation is approximately 4.5 m below the TSF crest elevation as mine operations were suspended in 1999 prior to the additional storage capacity provided by the Stage 4 embankment raise was fully realized.

- The water levels measured in the standpipe and vibrating wire piezometers were within the range of measurements from previous inspections. There are no concerns with the standpipe or vibrating wire piezometer data.

Recommendations from the 2014 DSI include:

- Continue with regular inspections of the dam and monitoring of the dam instrumentation,
- Developing an OMS Manual as per the CDA guidelines, and
- Schedule a DSR for 2015. The recommended frequency for DSR's for a dam with a "Significant" classification is every 10 years. A DSR has not been completed for the Blackdome Mine TSF.

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1 – INTRODUCTION

1.1 PROJECT DESCRIPTION

The Blackdome Mine is located in south western British Columbia, approximately 70 km northwest of Clinton. The mine is an underground gold mine, which was operated at a rate of 225 tonnes per day from 1986 to 1990, at which time mining operations were suspended. J-Pacific Gold Inc., formerly Claimstaker Resources Ltd., of Vancouver, B.C., subsequently obtained ownership of the mine and resumed mining operations in the fall of 1998 following restoration of the mill and an expansion to the Tailings Storage Facility (TSF). Mining operations were suspended in May of 1999, and the mine has since been operating on a care and maintenance basis. The Mine Site Plan is shown on Figure 1.1.

J-Pacific Gold changed its name to Sona Resources Corporation in January 2010.

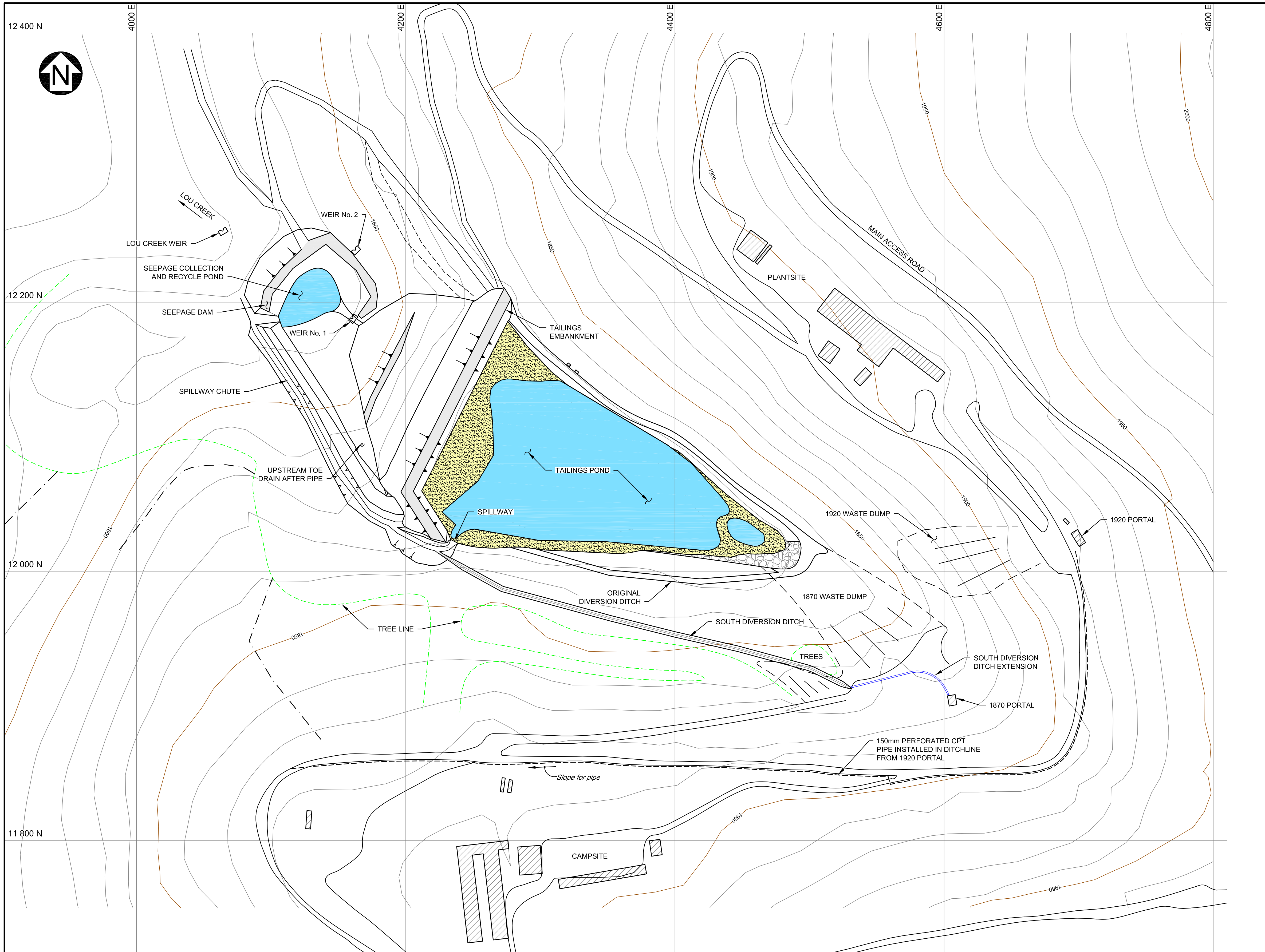
1.2 PROJECT HISTORY

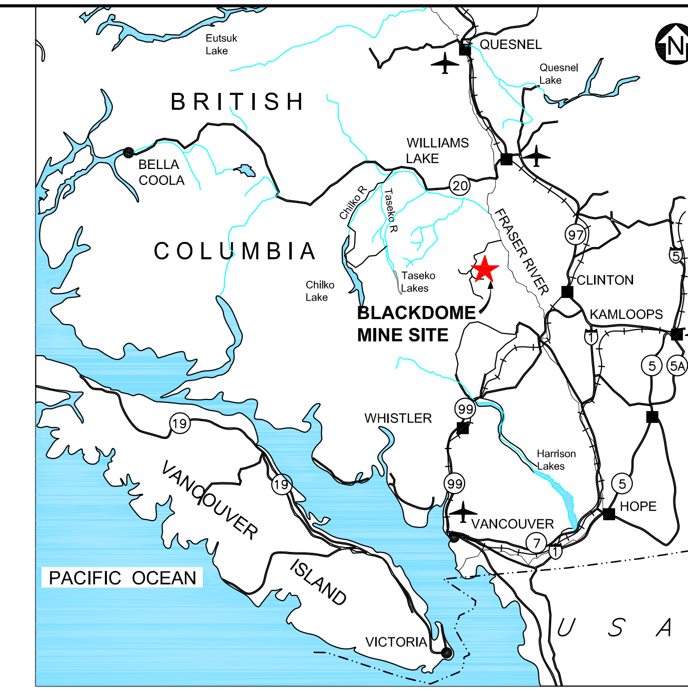
The original TSF was designed by Reimchen Urlich Geological Engineering, who also supervised construction of the first stage of the dam during 1985. The Stage 1 dam was built to a height of 21 m (crest El. 1815.4 m). The original design concept allowed for two years of tailings disposal within the Stage 1 impoundment. The Stage 1 embankment was constructed from predominantly glacial till material obtained from within the tailings impoundment. It was constructed as a homogeneous earthfill dam that included a coarse drainage zone along the base of the downstream shell.

Weathered and fractured bedrock were reported to have been encountered within the impoundment borrow area during the Stage 1 construction program, particularly along the north side of the impoundment. These exposed bedrock materials were concluded to be relatively pervious by the designers, particularly after unexpected high seepage flows of over 12 l/s (200 gpm) were observed from the dam toe during initial filling. The seepage rate decreased during operations, ranging from approximately 1 to 3 l/s (20 to 60 gpm), due to the accumulation of tailings in the facility.

The initial design concept assumed the coarse sandy fraction of the tailings would be cycloned and used for backfill in the underground mine. However, discharge of the full tailings stream into the impoundment resulted in an accelerated filling schedule which necessitated construction of the second stage of the dam in 1987, a year earlier than originally envisaged.

The Stage 2 expansion (1987 extension) was designed by Robinson Dames and Moore as a centreline embankment raise to an elevation of 1821 m. The downstream section of the embankment included a zone of mine waste rock up to El. 1805 m, overlain by compacted glacial till. An upstream toe drain was installed to control the phreatic surface. The upstream toe drain included a 150 mm diameter perforated plastic drain pipe with filter fabric surround that was placed along the upstream face of the embankment. The perforated drain pipe connects into a solid PVC pipe which extends through the left abutment of the tailings embankment.





KEY PLAN

NOTES:

1. PLAN IS APPROXIMATE AND IS BASED ON LIMITED TOPOGRAPHY AND SURVEY INFORMATION.

SCALE A 25 0 50 100 150 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	05NOV'14	ISSUED WITH REPORT	LJG	TAM	LJG	KJB

SONA RESOURCES CORPORATION

BLACKDOME MINE

TAILINGS STORAGE FACILITY
2014 ANNUAL INSPECTION
MINE SITE PLAN

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-70/15	1

FIGURE 1.1 REV 0

The Stage 3 expansion to the tailings embankment was designed by SRK-Robinson Inc. as an upstream raise to elevation 1825.6 m. The Stage 3 crest raise was approximately 5 m high and was constructed during 1988. The design incorporated wick drains within the sandy tailings beach, and an overlying gravel drain that connected to the previously installed upstream toe drain. The design engineers conducted extensive field and laboratory test work both prior to and after construction of the Stage 3 raise to evaluate the liquefaction potential of the foundation tailings and the seismic stability of the embankment. Localized tension cracks identified along a section of the upstream crest of the raise were also evaluated and were determined to have resulted from minor differential settlement from frozen foundation tailings.

Construction activities were also completed in 1990 to improve flood routing around and through the tailings impoundment and the Seepage Collection and Recycle Pond. These activities included remedial work and rip-rap placement along the stream diversion channel, the tailings impoundment overflow spillway, and the seepage pond overflow spillway. Mine waste rock was also placed on the tailings surface and along the upstream face of the tailings embankment at a slope of about 4H:1V.

The Stage 4 expansion of the TSF was designed in 1998 by Knight Piésold. The Stage 4 design included a 2.8 m centreline embankment raise on top of the Stage 3 embankment. This increased the Stage 4 crest elevation to 1828.4 m.

1.3 SCOPE OF REPORT

Sona Resources Corporation requested Knight Piésold (KP) complete the 2014 Dam Safety Inspection (DSI) of the TSF and prepare an inspection report that meets the guidelines outlined by the Ministry of Energy and Mines.

KP has completed annual inspections of the TSF since 1998. Les Galbraith, P.Eng., of KP visited the site on October 9, 2014 to conduct the inspection of the TSF. The inspection was completed in the company of Nick Ferris, Executive Chairman of Sona Resources. This report presents the results of the inspection. The inspection involved making visual observations of the TSF and surrounding surface runoff diversion works, as well as obtaining water level readings from piezometers and flow measurements from weirs.

2 – SITE INSPECTION

2.1 GENERAL

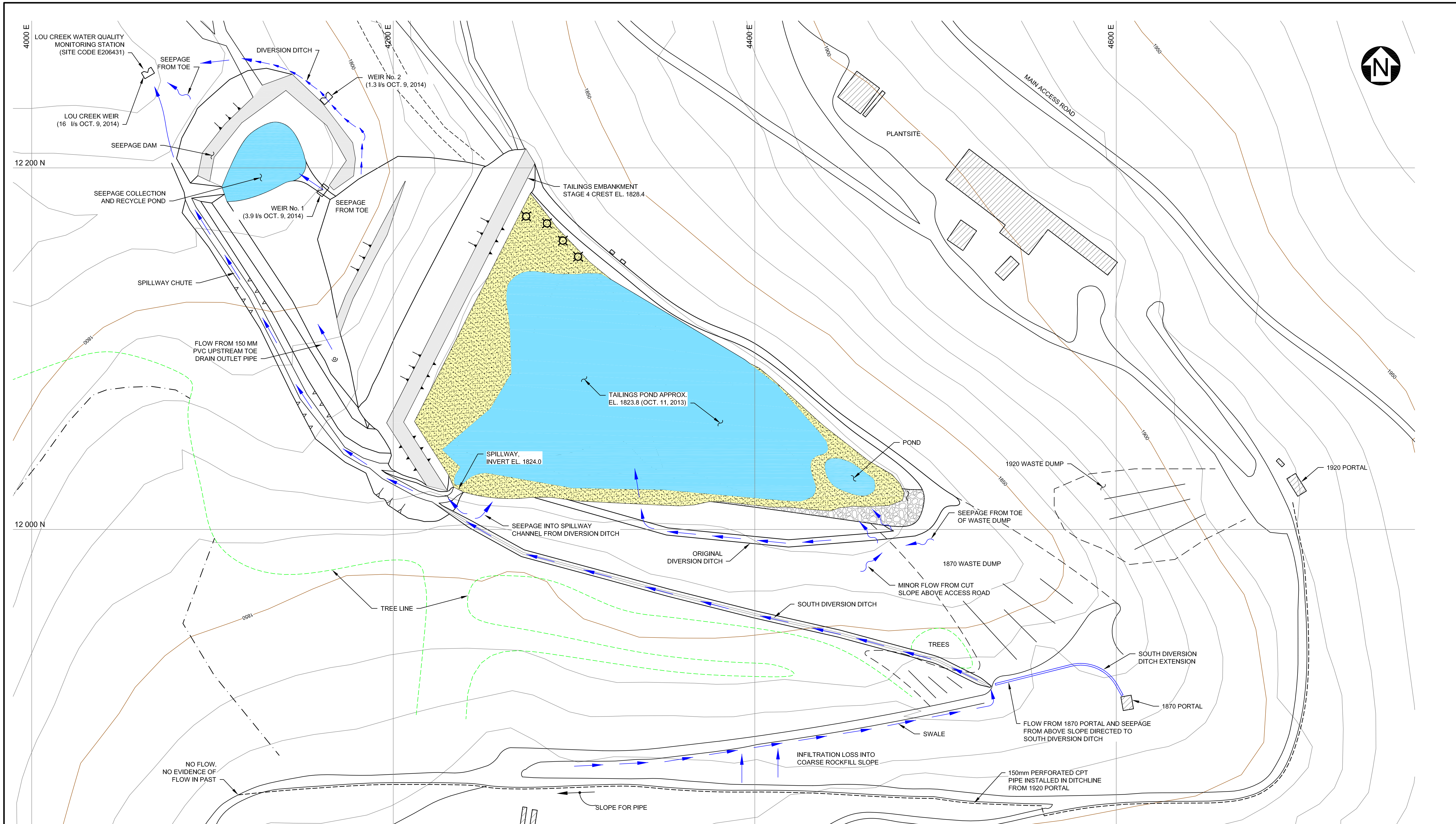
Les Galbraith arrived on site on October 9, 2014. Discussions were held with Nick Ferris regarding activities and observations at the TSF over the past year.

The 2014 inspection included the following activities:

- Visually inspecting the TSF and the Seepage Collection and Recycle Pond
- Reading the vibrating wire piezometers
- Measuring the water levels in the standpipe piezometers
- Visually inspecting the flow from the upstream toe drain
- Measuring the flows at Weirs No. 1, No. 2, and the Lou Creek weir
- Inspecting the excavated trench at the 1870 portal
- Inspecting the surface runoff diversion works, and
- Inspecting the TSF spillway.

The weather conditions at the time of the inspection consisted of partly cloudy skies.

The site inspection plan is shown on Figure 2.1. The piezometer planes, plan and sections, are shown on Figure 2.2. Photographs from the site inspection are provided in Appendix A.



LEGEND:

- WATER STORAGE AND FLOW PATHS
- SINKHOLE LOCATION (APPROXIMATE)

NOTES:

1. PLAN IS APPROXIMATE AND IS BASED ON LIMITED TOPOGRAPHY AND SURVEY INFORMATION.

SCALE A: 20 10 0 20 40 60 80 100 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
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SONA RESOURCES CORPORATION

BLACKDOME MINE

TAILINGS STORAGE FACILITY
2014 ANNUAL INSPECTION
SITE INSPECTION PLAN

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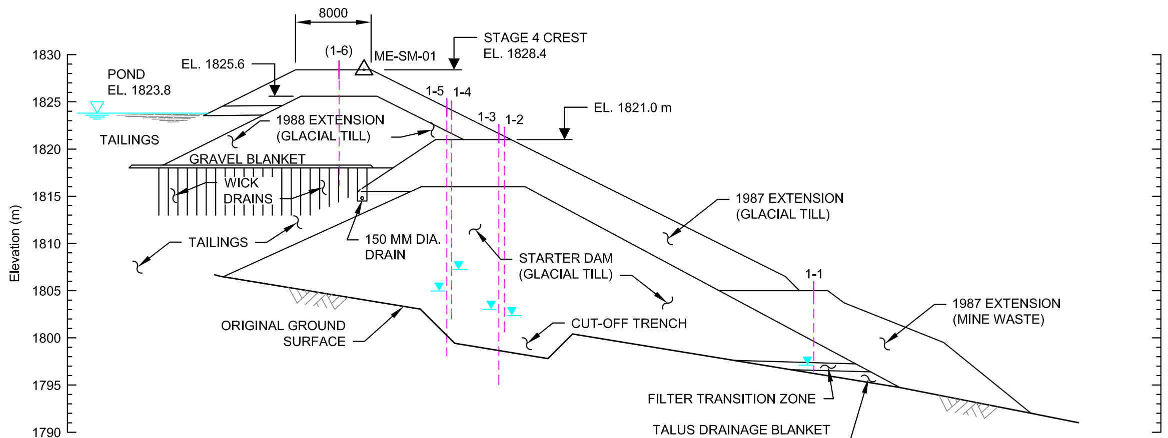
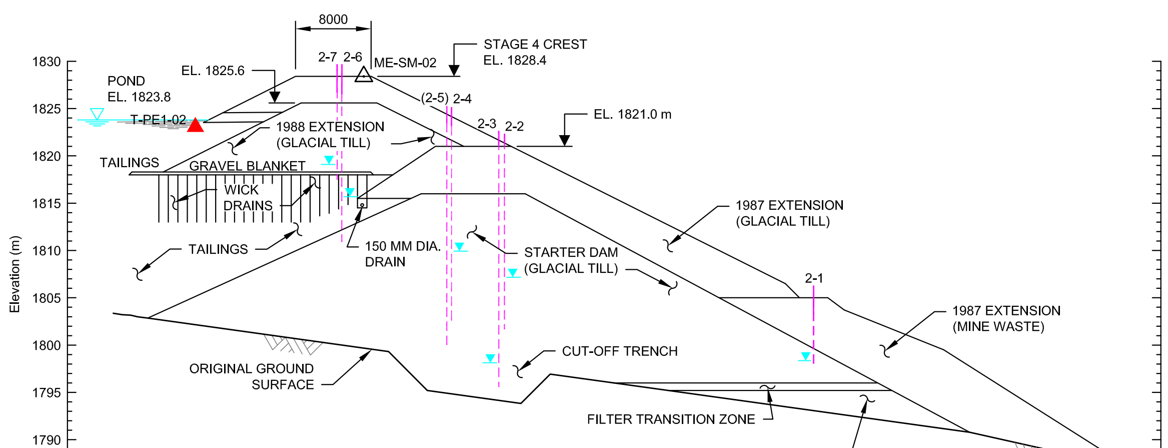
P/A NO. VA101-70/15 | REF NO. 1

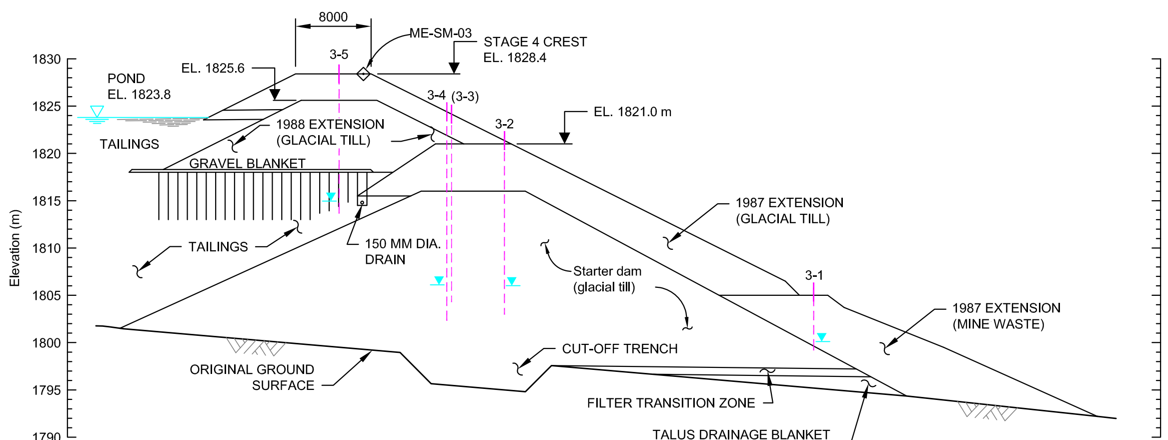
FIGURE 2.1 | REV 0



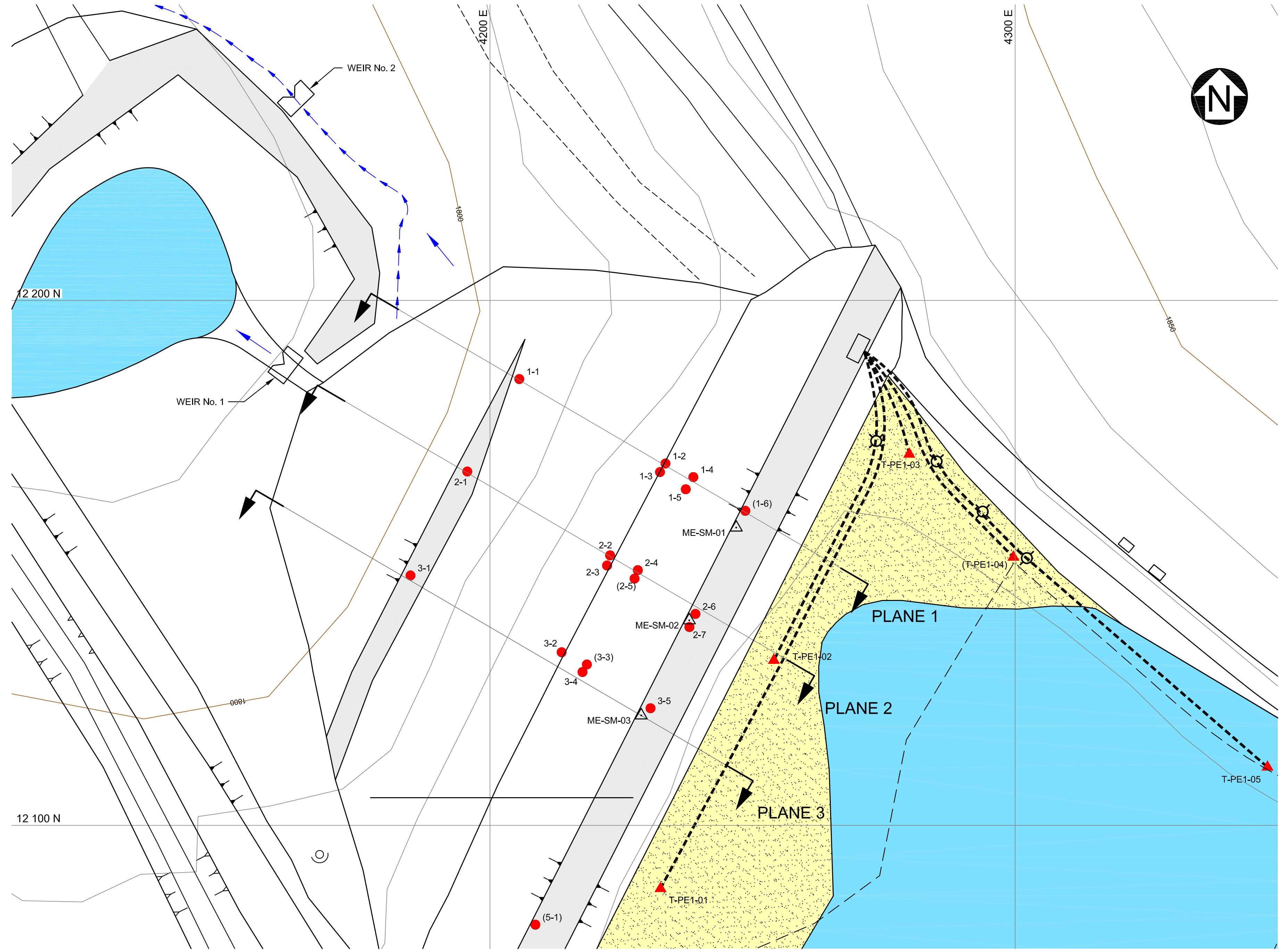
PLANE 1
SCALE B



PLANE 2
SCALE B



PLANE 3
SCALE B



PLAN
SCALE A

LEGEND

- 1-2 ● EXISTING STANDPIPE PIEZOMETER LOCATION AND LABEL
- (5-1) ● PIEZOMETER NO LONGER FUNCTIONING
- WATER LEVEL (NOV. 5, 2014)
- ▲ TAILINGS VIBRATING WIRE PIEZOMETER LOCATION
- △ EMBANKMENT SURVEY MONUMENT LOCATION
- FLOW WEIR
- SINKHOLE LOCATION (APPROXIMATE)

STAGE 4 PIEZOMETER AND SURVEY MONUMENT LABELS

T-PE1-01
- AREA (T-TAILINGS, D-DRAIN, ME-MAIN EMBANKMENT)
- NUMBER I.D.
- PRESSURE RATING (1-LOW, 2-HIGH)
- TYPE OF INSTRUMENTATION (PE-PIEZOMETER ELECTRIC, SM-SURVEY MONUMENT)

NOTES

1. SECTIONS ARE APPROXIMATE ONLY AND ARE BASED ON PREVIOUS DESIGN AND CONSTRUCTION DRAWINGS BY OTHERS.
2. WATER LEVELS SHOWN FOR STANDPIPE PIEZOMETERS 1-1, 2-1, 3-1 AND 2-7 ARE ASSUMED. WATER IS LIKELY TRAPPED IN THE TIPS OF THE PIEZOMETERS.
3. SURVEY MONUMENT AND PIEZOMETER AS-BUILT INFORMATION FROM OCTOBER 2000 SITE INSPECTION.

SCALE B: 5 0 10 20 30 40 m

SCALE A: 10 5 0 10 20 30 40 50 m

SONA RESOURCES CORPORATION

BLACKDOME MINE

TAILINGS STORAGE FACILITY
2014 ANNUAL INSPECTION
PIEZOMETER PLANES-PLAN AND SECTIONS

Knight Piésold CONSULTING

P/A NO.	REF NO.
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FIGURE 2.2 REV 0

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	05NOV'14	ISSUED WITH REPORT	LJG	TAM	LJG	KJB

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2.2 2014 ACTIVITIES

There have been no activities at the mine site in the past year.

2.3 TAILINGS STORAGE FACILITY

2.3.1 TSF Dam Classification

The classification of the tailings dam was determined by considering the incremental consequence of failure on life safety and economic, social and/or environmental impacts and population at risk. The TSF classification has been evaluated according to the 2013 CDA Dam Safety Guidelines and the 2014 CDA Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams. The dam classification is considered to be "Significant" during the care and maintenance period. The CDA classification guidelines are summarized in Table 2.1.

Table 2.1 Dam Classification

Dam Class	Population at risk [2]	Incremental losses		
		Loss of life [3]	Environmental and cultural values	Infrastructure and economics
Low	None	0	Minimal short-term loss. No long-term loss.	Low economic losses; area contains limited infrastructure or services.
Significant	Temporary only	Unspecified	No significant loss or deterioration of fish or wildlife habitat. Loss of marginal habitat only. Restoration or compensation in kind highly possible.	Losses to recreational facilities, seasonal workplaces, and infrequently used transportation routes.
High	Permanent	10 or fewer	Significant loss or deterioration of important fish or wildlife habitat. Restoration or compensation in kind highly possible.	High economic losses affecting infrastructure, public transportation, and commercial facilities.
Very high	Permanent	100 or fewer	Significant loss or deterioration of critical fish or wildlife habitat. Restoration or compensation in kind possible but impractical.	Very high economic losses affecting important infrastructure or services (e.g., highway, industrial facility, storage facilities for dangerous substances)
Extreme	Permanent	More than 100	Major loss of critical fish or wildlife habitat. Restoration or compensation in kind impossible	Extreme losses affecting critical infrastructure or services (e.g., hospital, major industrial complex, major storage facilities for dangerous substances)

The suggested design flood and earthquake design Annual Exceedance Probabilities (AEPs) for the CDA dam classifications during operations, as per the 2013 CDA Dam Safety Guidelines and the 2014 CDA Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams, are shown on Table 2.2.

Table 2.2 Suggested Design Flood and Earthquake Levels

Dam Class	Annual Exceedance Probability	
	Floods	**Earthquakes**
Low	1/100	1/100
Significant	Between 1/100 and 1/1000	Between 1/100 and 1/1,000
High	1/3 between 1/1000 and PMF	1/2,475
Very high	2/3 between 1/1000 and PMF	1/2 between 1/2,475 and 1/10,000 or MCE
Extreme	PMF	1/10,000 or MCE

NOTES:
1. Acronyms: PMF, probable maximum flood; AEP, annual exceedance probability; MCE, maximum credible earthquake.

The suggested AEP's for a dam with a "Significant" classification are between 1/100 and 1/1000 for both the flood and earthquake events.

The 2013 CDA Dam Safety Guidelines and the 2014 CDA Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams states that for classifications that provide a range for the AEP, the design "criteria should be commensurate with the range of potential consequences for the particular dam. A risk assessment may be necessary to justify the selection of criteria". It is recommended the appropriate AEP for flood and earthquake conditions be evaluated as part of the next Dam Safety Review (DSR) scheduled for 2015.

2.3.2 Tailings Pond

The elevation of the tailings pond at the time of the inspection was approximately 1823.9 m, which is approximately 0.1 m higher than observed in 2013. This is within the range of previously observed pond elevations. The pond elevation is slightly below the spillway invert elevation. There are no concerns with the elevation of the tailings pond.

Surface water inflows into the pond were from seepage at the toe of the 1870 Waste Dump, as well as minor seepage from the cut slope below the South Diversion Ditch and from the cut slope adjacent to the spillway.

The four sinkholes observed along the north flank of the facility during the 1998 inspection were observed again in 2014. The sinkholes are above the water level of the tailings pond and no water was flowing into them. The sinkholes resulted when tailings material migrated through permeable talus and rockfill in the embankment foundation. Previous evaluations recognized the sinkholes and associated seepage through the embankment foundations were unlikely to pose a risk to dam stability, as the foundation materials were considered to be non-erosive.

2.3.3 Tailings Embankment Spillway

The TSF spillway was designed to pass the 200 year 24-hour storm event. There was no water discharging through the spillway at the time of the inspection. The spillway was observed to be in good condition and showed no signs of erosion.

2.3.4 Tailings Embankment

No signs of deformation were identified on the tailings embankment. The embankment slopes were approximately planar and there was no evidence of cracking, bulging or slumping in the embankment fill materials. The embankment crest appeared to be relatively level with no signs of differential settlement. There was no evidence of animal burrowing.

A seepage flow rate of approximately 8 l/s was measured at Weir No. 1 at the downstream toe of the tailings embankment above the Seepage Collection and Recycle Pond. A flow rate of approximately 1.3 l/s was measured at Weir No. 2 in the diversion ditch below the right abutment of the TSF embankment. Flows at both weirs were clear. A history of flow monitoring at Weirs No. 1 and No. 2 is summarized in Table 2.3. The weir flows dating back to 2001 are shown on Figure 2.3. The flows recorded at Weirs No. 1 and No. 2 are similar to those measured during previous inspections.

Flow from the upstream toe drain outlet pipe at the left abutment was estimated at 0.05 L/s. This is consistent with the flow estimated during the 2013 inspection.

2.3.5 Freeboard

The Stage 4 design of the TSF included a minimum freeboard of 1.3 m above the spillway invert elevation to provide for managing the 1 in 200 year 24-hour storm event and to provide an additional 1.0 m of contingency freeboard for protection against overtopping and wave action. The current pond elevation is approximately 4.5 m below the TSF crest elevation as the mine operations were suspended in 1999 prior to the additional storage capacity provided by the Stage 4 embankment raise was fully realized. The diversion ditches and the TSF spillway are effectively managing the pond elevation as it has remained relatively constant in the past ten years.

2.3.6 Piezometers

A total of 15 functional standpipe piezometers are located in the tailings embankment along four monitoring planes designated as Monitoring Planes 1, 2, 3 and 5. The standpipe piezometers were installed by others during the construction of the TSF embankment. Knight Piésold has conducted annual monitoring of the piezometers since the 1998 Annual Inspection. Standpipe piezometers 1-6, 2-5, 3-3, and 5-1 are no longer functioning. A summary of the standpipe piezometer readings is shown in Table 2.4. The locations of all the piezometers are shown on Figure 2.2. The measured water elevation in the standpipe piezometers is shown on Figures 2.4, 2.5 and 2.6 for monitoring planes 1, 2 and 3 respectively (there was only one standpipe piezometer installed in Monitoring Plane 5 and it is no longer functioning).

Five vibrating wire piezometers were installed in the tailing beaches along the north side of the facility and adjacent to the upstream face of the embankment as part of the Stage 4 construction program completed in 1998. A summary of the vibrating wire piezometer readings is shown in

Table 2.4. Vibrating wire piezometer T-PE1-04 is no longer functioning. A plot of the vibrating wire piezometer readings is shown on Figure 2.7.

The measured water levels in the standpipe and vibrating wire piezometers are consistent with measured values from previous inspections. There are no concerns with the standpipe or vibrating wire piezometer data.

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TABLE 2.3

SONA RESOURCES
BLACKDOME MINE
TAILINGS STORAGE FACILITY

2014 ANNUAL INSPECTION
FLOW MONITORING AT WEIRS

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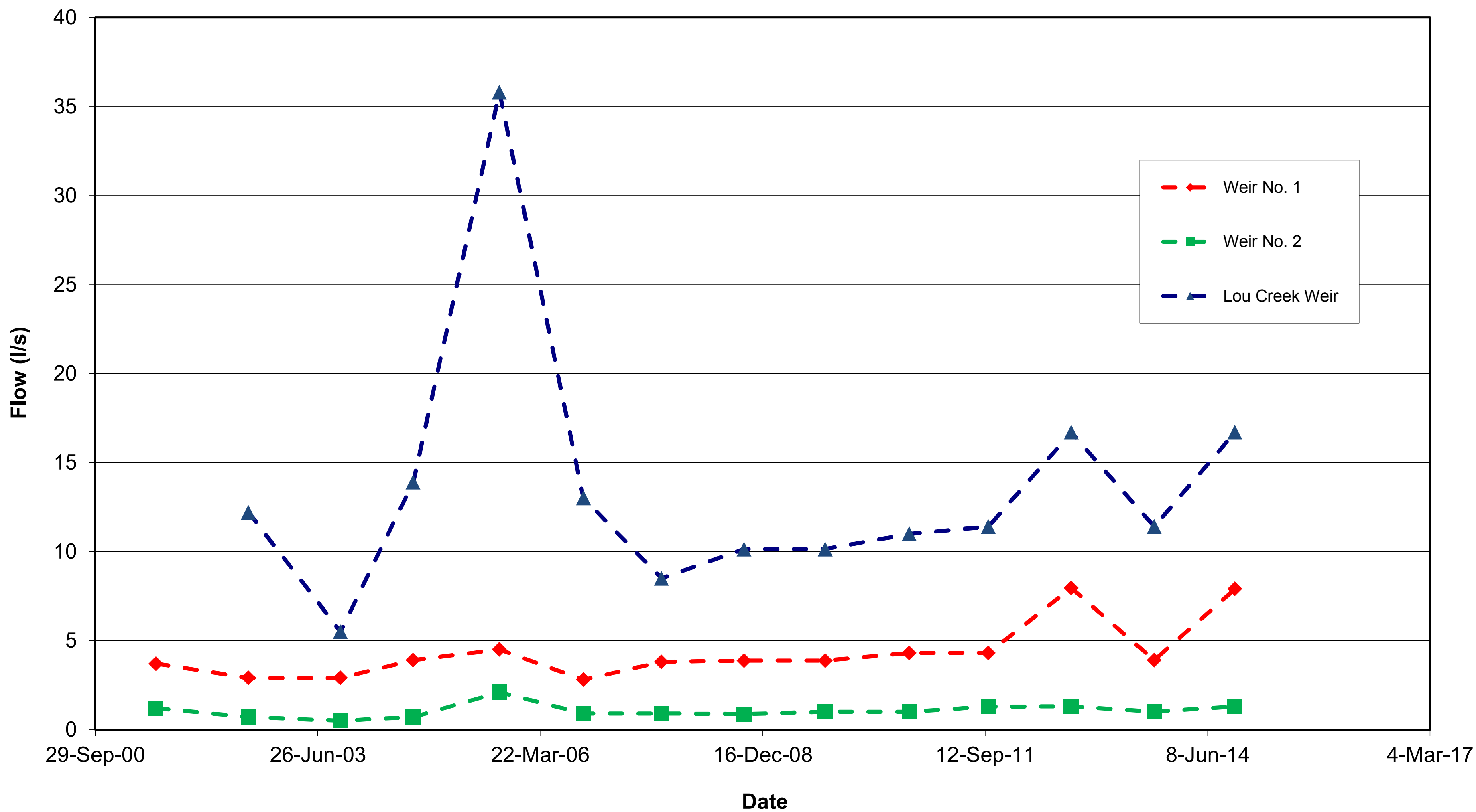
Date	Flows (L/s)			Comments
	Weir No. 1	Weir No. 2	Lou Creek	
1-Oct-98	2.9	0.2		Pond flow to sinkholes cut off by trenching along east flank of TSF.
3-Oct-98	2.8	0.1		After snowfall.
4-Oct-98	4.4	0.2		At start of tailings discharge into remedial trench.
5-Oct-98	4.5	0.3		Silty water at Weir-1.
6-Oct-98	5.6	0.4		Silty water at Weir-1.
7-Oct-98	5.9	0.5		Still cloudy water at Weir-1, but clearer.
8-Oct-98	6.6	0.6		Slightly cloudy at Weir-1.
9-Oct-98	6.3	0.6		After start of discharge into west half of trench. Slightly cloudy at Weir-1.
10-Oct-98	6.0	0.7		During snowmelt, Weir-1 slightly cloudy.
12-Oct-98	5.2	0.5		Silty water at Weir-1.
13-Oct-98	4.2	0.6		Silty water at Weir-1.
14-Oct-98	3.3	0.4		Silty water at Weir-1.
15-Oct-98	2.9	0.3		Silty water at Weir-1.
16-Oct-98	2.6	0.3		Silty water at Weir-1.
17-Oct-98	3.0	0.5		During snowfall. Silty water at Weir-1.
19-Oct-98	2.5	0.2		Slightly cloudy at Weir-1.
20-Oct-98	2.5	0.3		During snowmelt. Slightly cloudy at Weir-1.
21-Oct-98	2.3	0.2		Slightly cloudy at Weir-1.
22-Oct-98	2.3	0.2		Slightly cloudy at Weir-1.
23-Oct-98	2.3	0.2		Slightly cloudy at Weir-1.
24-Oct-98	2.3	0.2		Slightly cloudy at Weir-1.
25-Oct-98	2.1	0.2		Slightly cloudy at Weir-1.
26-Oct-98	2.0	0.2		Slightly cloudy at Weir-1.
27-Oct-98	2.0	0.2		Slightly cloudy at Weir-1.
2-Nov-98	2.1	0.2		Clear at both weirs.
4-Nov-98	2.0	0.2		Clear at both weirs.
21-Jul-00	13.2	3.9		Clear at both weirs.
29-Sep-00	3.4	0.6		Clear at both weirs.
29-Jun-01	3.7	1.2		Clear at both weirs.
19-Aug-02	2.9	0.7	12.2	Clear at all three weirs.
6-Oct-03	2.9	0.5	5.5	Clear at all three weirs.
28-Aug-04	3.9	0.7	13.9	Clear at all three weirs.
20-Sep-05	4.5	2.1	35.8	Clear at all three weirs.
3-Oct-06	2.8	0.9	13.0	Clear at all three weirs.
18-Sep-07	3.8	0.9	8.5	Clear at all three weirs.
24-Sep-08	3.9	0.9	10.1	Clear at all three weirs.
23-Sep-09	3.9	1.0	10.1	Clear at all three weirs.
6-Oct-10	4.3	1.0	11.0	Clear at all three weirs.
27-Sep-11	4.3	1.3	11.4	Clear at all three weirs.
3-Oct-12	7.9	1.3	16.7	Clear at all three weirs.
11-Oct-13	3.9	1.0	11.4	Clear at all three weirs.
9-Oct-14	8.0	1.3	17.0	Clear at all three weirs.

M:\1\01\00070\15\A\Data\[Weir Data - Rev 0 2013.xlsx]Table 2.3

0	05NOV'14	ISSUED WITH REPORT	LJG	LJG	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D



SONA RESOURCES CORPORATION

BLACKDOME MINE

TAILINGS STORAGE FACILITY
2014 ANNUAL INSPECTION
WEIR FLOW RATES

Knight Piésold CONSULTING

P/A NO. VA101-70/15

REF NO. 1

FIGURE 2.3

REV 0

0	05NOV'14	ISSUED WITH REPORT	LJG	LJG	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

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TABLE 2.4

SONA RESOURCES CORPORATION
BLACKDOME MINE - TAILINGS STORAGE FACILITY

2014 ANNUAL INSPECTION
PIEZOMETER MEASUREMENTS - SUMMARY

Print Nov/26/2008 11:55:23

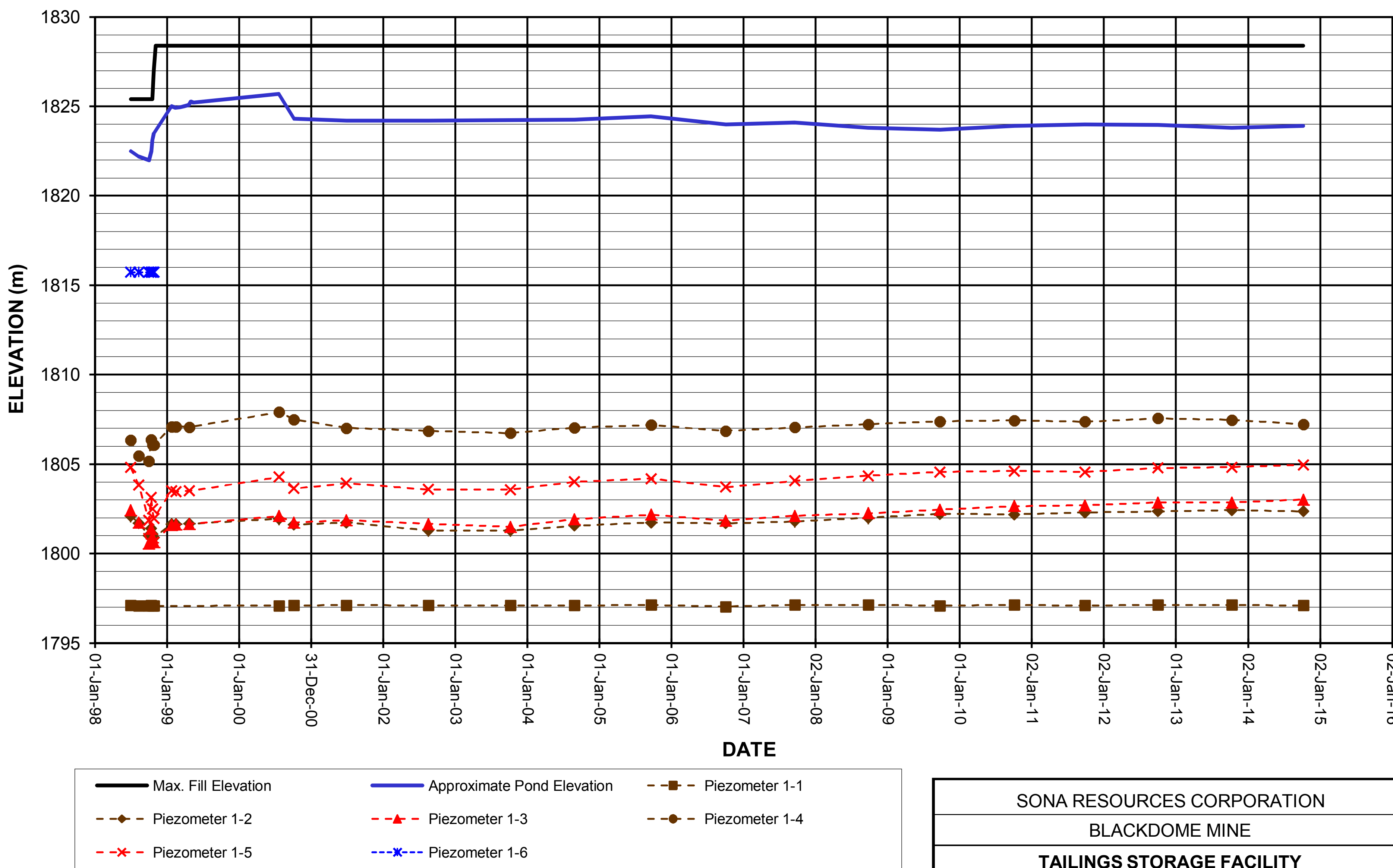
STANDPIPE PIEZOMETER NO.	SCREEN LOCATION	TIP El. (m)	6-Oct-10	27-Sep-11	3-Oct-12	11-Oct-13	9-Oct-14	Change From Prev. Reading	COMMENTS
Plane 1									
1-1	Glacial Till or Mine Waste Fill	1796.97	*1797.13*	*1797.11*	*1797.13*	*1797.13*	*1797.11*	-0.02	Water likely trapped in piezometer tip.
1-2	Glacial Till Fill	1800.31	1802.19	1802.30	1802.36	1802.42	1802.36	-0.06	
1-3	Foundation	1794.74	1802.65	1802.70	1802.85	1802.85	1803.02	0.17	
1-4	Glacial Till Fill	1801.73	1807.44	1807.38	1807.56	1807.47	1807.22	-0.24	
1-5	Foundation	1797.56	1804.61	1804.57	1804.79	1804.82	1804.96	0.14	
1-6	Tailings	1815.72	--	--	--	--	--		Piezometer sheared off following Stage 4 construction.
Plane 2								0.00	
2-1	Glacial Till Fill	1797.84	*1798.32*	*1798.63*	*1798.43*	*1798.57*	*1798.35*	-0.21	`
2-2	Glacial Till Fill	1802.41	1807.20	1807.37	1807.62	1807.56	1807.17	-0.40	
2-3	Foundation or Glacial Till Fill	1795.32	1797.72	1797.80	1797.87	1798.01	1798.13	0.12	
2-4	Glacial Till Fill	1802.48	1808.94	1809.62	1809.97	1809.77	1809.93	0.15	
2-5	Glacial Till Fill	1799.68	-	-	-	-	-		Standpipe broken at 3.0 m while removing cap.
2-6	Tailings	1810.60	1815.25	1815.49	1815.54	1815.72	1815.69	-0.03	
2-7	Glacial Till Fill	1818.87	*1819.11*	*1819.10*	*1819.10*	*1819.13*	*1819.10*	-0.03	Water likely trapped in piezometer tip.
Plane 3								0.00	
3-1	Glacial Till or Mine Waste Fill	1800.05	*1800.08*	*1800.09*	*1800.04*	*1800.04*	*1800.11*	0.06	Water likely trapped in piezometer tip.
3-2	Glacial Till Fill	1802.60	1805.83	1805.89	1805.84	1805.86	1806.01	0.15	
3-3	Glacial Till Fill	1820.59	--	--	--	--	--		Standpipe broken or blocked.
3-4	Glacial Till Fill	1802.31	1805.92	1805.98	1805.95	1805.95	1806.10	0.15	
3-5	Tailings	1813.67	1814.49	1814.53	1814.67	1814.52	1814.96	0.44	
Plane 5									
5-1	Tailings	1815.02	---					--	Standpipe buried.

WIRE PIEZOMETER NO.	TIP LOCATION	TIP El. (m)	6-Oct-10	27-Sep-11	3-Oct-12	11-Oct-13	9-Oct-14	Change From Prev. Reading	COMMENTS
T-PE1-01	Tailings	1820.70	1823.27	1823.37	1823.44	1822.88	1823.18	0.31	Temperature reading not working (temp assumed)
T-PE1-02	Tailings	1820.60	1823.20	1823.28	1823.33	1822.51	1823.06	0.55	
T-PE1-03	Tailings	1821.18	1822.40	1822.30	1822.47	1821.96	1822.26	0.30	
T-PE1-04	Tailings	1822.33	1823.97	1823.88	1823.88	-	-		Not working in 2013
T-PE1-05	Tailings	1821.54	1823.48	1823.45	1823.54	1822.94	1823.26	0.32	

M:\1\01\00070\15\A\Data\[Fig 2.4 - 2.7 Piezometers_R0 2012.xlsx]Table 2.2

NOTES:
1. NUMBERS IN ITALICS INDICATE ASSUMED WATER ELEVATION.
2. PIEZOMETERS 1-6, 2-5, 3-3 AND 5-1 ARE NOT FUNCTIONAL. VIBRATING WIRE T-PE1-05 NOT FUNCTIONING AT TIME OF 2013 INSPECTION.

0	05NOV13	ISSUED WITH REPORT VA101-70/14-1	LJG	LJG	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D



NOTES:

1. DASHED LINES INDICATE ASSUMED WATER LEVELS.
2. PIEZOMETER 1-6 NOT FUNCTIONING.

0	05NOV'14	ISSUED WITH REPORT	LJG	LJG	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

SONA RESOURCES CORPORATION

BLACKDOME MINE

TAILINGS STORAGE FACILITY
2014 ANNUAL INSPECTION
STANDPIPE PIEZOMETER MONITORING - PLANE 1

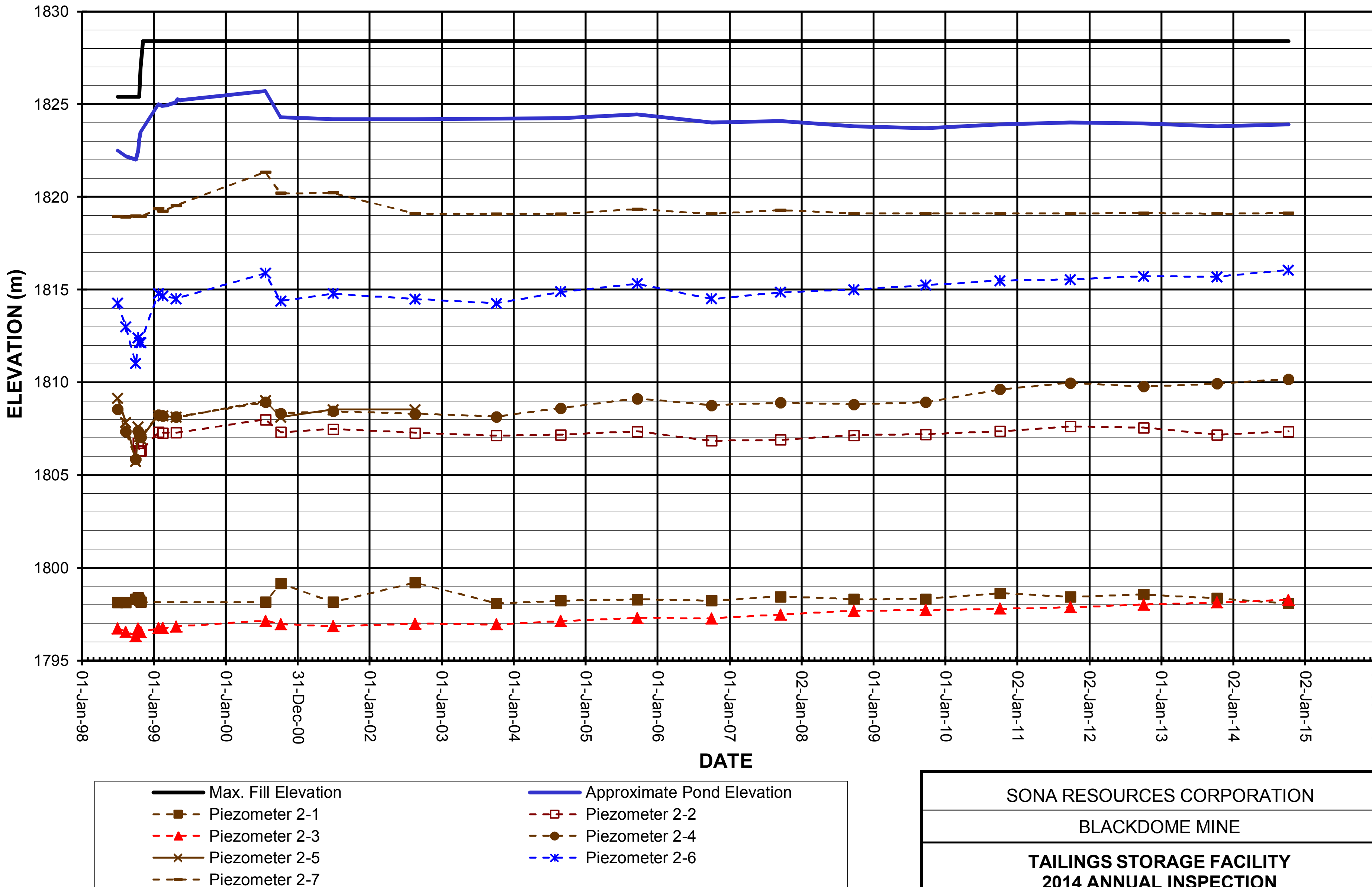
Knight Piésold CONSULTING

P/A NO. VA101-70/15

REF NO. 1

FIGURE 2.4

REV 0



NOTES:
1. DASHED LINES INDICATE ASSUMED WATER LEVELS.
2. PIEZOMETER 2-5 NOT FUNCTIONING.

0	05NOV'14	ISSUED WITH REPORT	LJG	LJG	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

SONA RESOURCES CORPORATION

BLACKDOME MINE

TAILINGS STORAGE FACILITY
2014 ANNUAL INSPECTION
STANDPIPE PIEZOMETER MONITORING - PLANE 2

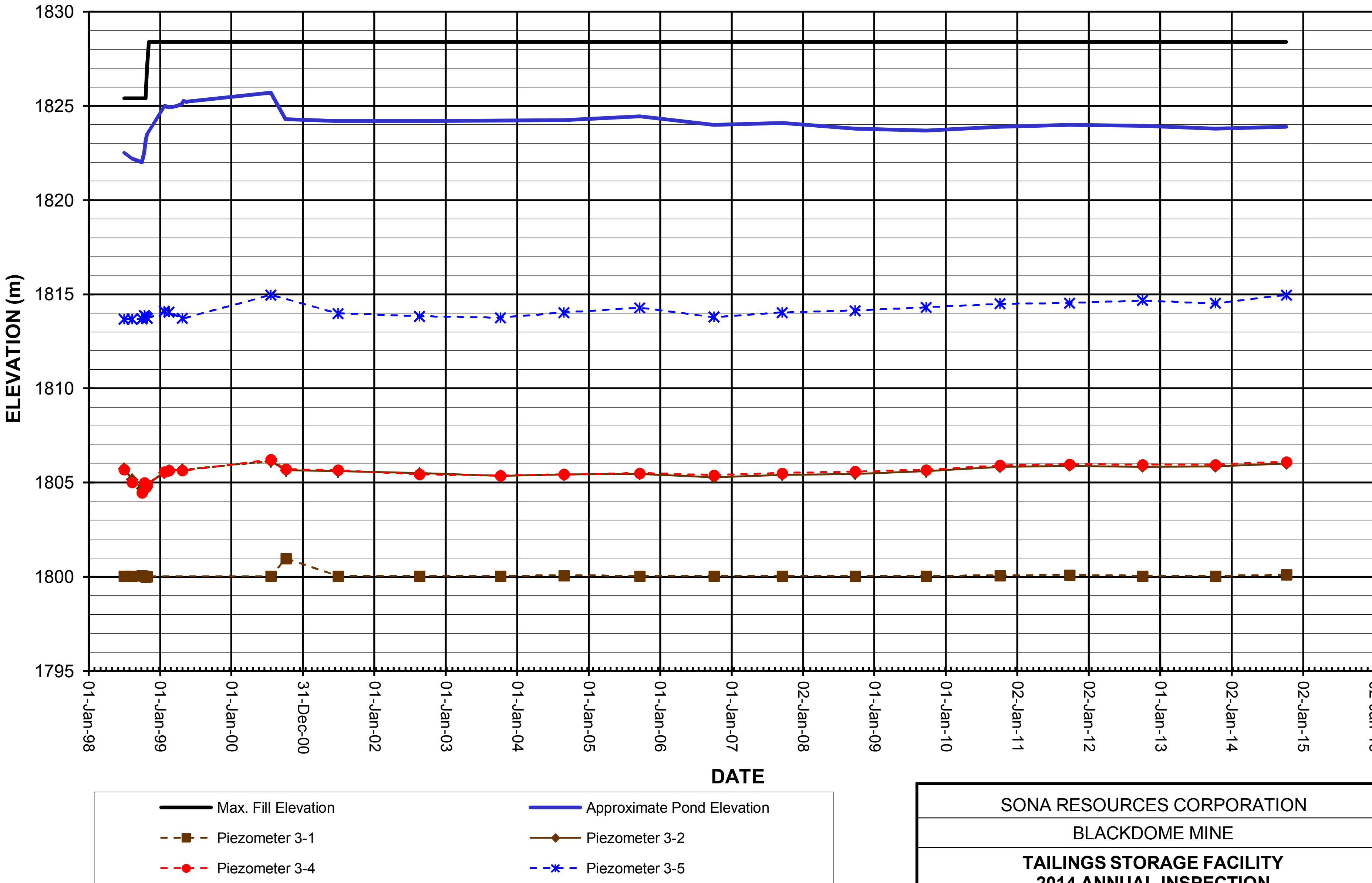
Knight Piésold CONSULTING

P/A NO. VA101-70/15

REF NO. 1

FIGURE 2.5

REV 0



NOTES:
1. DASHED LINES INDICATE ASSUMED WATER LEVELS.
2. PIEZOMETER 3-3 NOT FUNCTIONING.

0	05NOV'14	ISSUED WITH REPORT	LJG	LJG	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

SONA RESOURCES CORPORATION

BLACKDOME MINE

TAILINGS STORAGE FACILITY
2014 ANNUAL INSPECTION
STANDPIPE PIEZOMETER MONITORING - PLANE 3

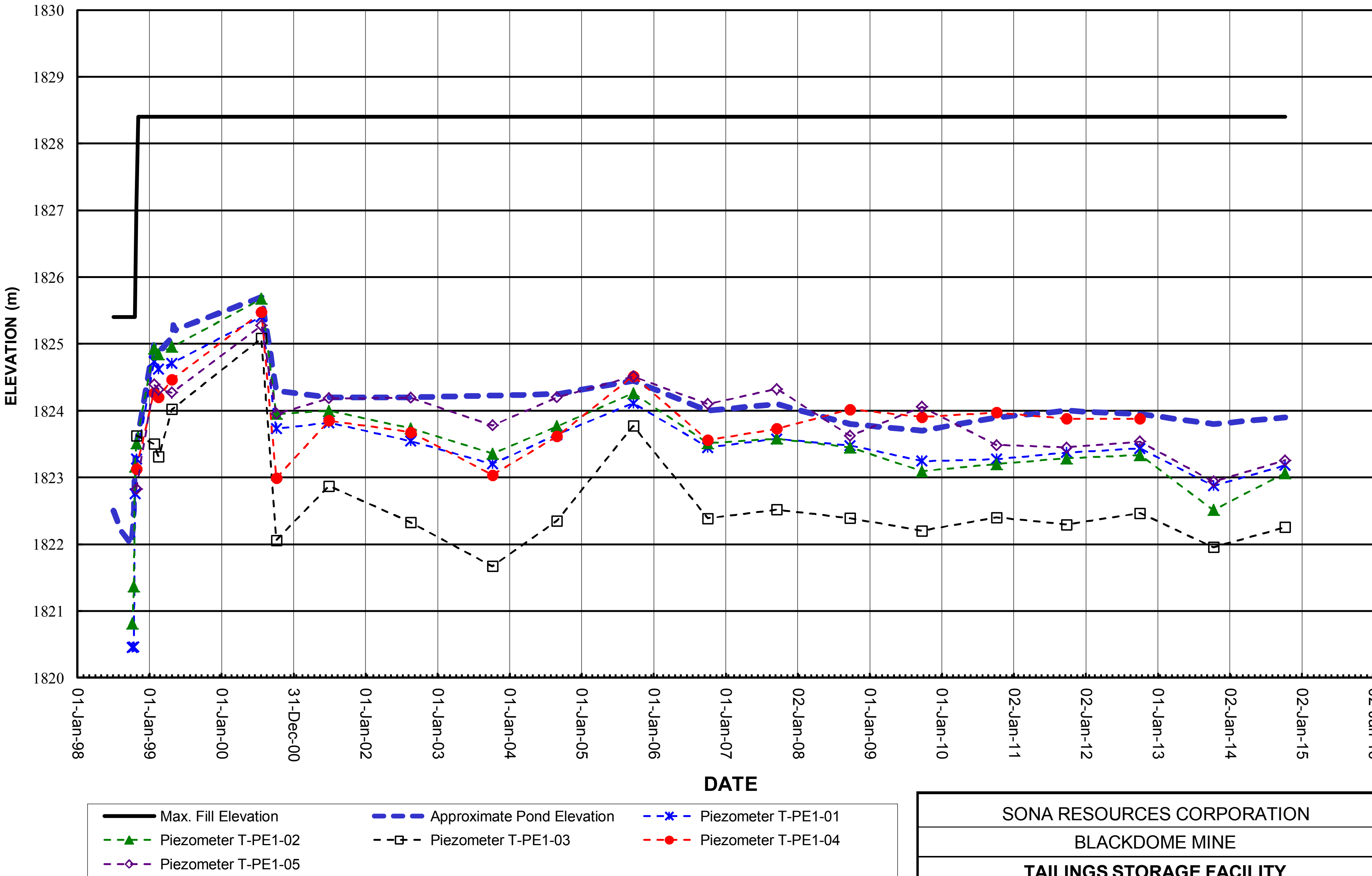
Knight Piésold CONSULTING

P/A NO. VA101-70/15

REF NO. 1

FIGURE 2.6

REV 0



NOTES:
1. DASHED LINES INDICATE ASSUMED WATER LEVELS.
2. PIEZOMETER T-PE1-04 NOT FUNCTIONING.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	07NOV'14	ISSUED WITH REPORT	LJG	LJG	KJB

SONA RESOURCES CORPORATION

BLACKDOME MINE

TAILINGS STORAGE FACILITY
2014 ANNUAL INSPECTION
VIBRATING WIRE TAILINGS PIEZOMETERS

Knight Piésold CONSULTING

P/A NO. VA101-70/15

REF NO. 1

FIGURE 2.7

REV 0

2.3.7 Survey Monuments

The survey monuments have not been monitored since being installed in October 2000 and further monitoring is not required during the care and maintenance period unless visual monitoring identifies possible settlement or distress.

2.4 DAM STABILITY

The stability of the TSF was reviewed as part of the Stage 4 design completed in 1998. The stability analyses were completed for the following conditions:

- Static conditions,
- Seismic loading conditions. The seismic stability analyses evaluated the Operating Basis earthquake (OBE) and the Maximum Design Earthquake (MDE). Seismic coefficients of 0.063 and 0.15 were used for the OBE and MDE analyses respectively
- Post liquefaction conditions assuming a residual tailings strength, and
- Upstream stability.

The stability analyses were completed for two separate cases; Case 1 with a depressed phreatic surface in the embankment, and a conservative Case 2 which assumed an elevated phreatic surface in the embankment fill materials. The current phreatic surface in the TSF embankment is within the range of the cases modelled.

The material parameters and results of the stability analyses from the Stage 4 TSF design are included in Appendix B. The stability analyses indicate the TSF is stable under all conditions modelled.

2.5 SEEPAGE COLLECTION AND RECYCLE POND

The Seepage Collection and Recycle Pond is located directly below the TSF and collects flow through the TSF embankment. The water collected in the Seepage Collection and Recycle Pond typically exits the pond as seepage through and beneath the rockfill embankment. This flow is visible at the base of the embankment. The elevation of the water in the Seepage Collection and Recycle Pond was below the spillway invert and no water was discharging through the spillway at the time of the inspection. The water in the Seepage Collection and Recycle Pond was visually clear and free from suspended solids.

There was no evidence of tension cracking and slumping in the structure and no evidence of animal burrowing.

The Lou Creek Weir, located just below the toe of the Seepage Collection and Recycle Pond, monitors the surface water flows from the TSF, the South Diversion Ditch, and flows through and beneath the Seepage Collection and Recycle Pond. Flow over the weir at the time of the inspection was measured at approximately 17 l/s. The flow at the Lou Creek Weir was clear. A history of the flow monitoring at the Lou Creek Weir is shown in Table 2.3. The Lou Creek flows dating back to 2001 are shown on Figure 2.3.

2.6 SURFACE DIVERSION WORKS

2.6.1 South Diversion Ditch

The South Diversion Ditch extends from the 1870 Portal and joins the TSF spillway downstream of the TSF embankment crest. This ditch was constructed between August and October 1999 and extended to the 1870 Portal in 2003. The approximate location of the South Diversion Ditch is shown on Figure 2.1. The ditch extension directs drainage from the 1870 Portal to the south diversion ditch and also collects seepage from the access trail cut slope above the portal.

The south diversion ditch joins the TSF spillway immediately downstream of the TSF embankment crest at the left abutment. The South Diversion Ditch was in good condition and was successfully diverting water around the TSF.

2.6.2 Road Drainage Systems

An inspection of the access road drainage ditch that extends from the 1920 Portal around and above the south side of the TSF was also carried out. The ditch was inspected near the discharge end and no flow was present. Fractured bedrock was exposed in the ditch in places and likely provides a preferred infiltration pathway for the flow.

2.7 WATER QUALITY MONITORING

Water quality sampling is routinely completed with the results submitted directly to the permitting agencies. It is our understanding that there have not been any instances of adverse discharge water quality over the reporting period.

3 – SUMMARY AND RECOMMENDATIONS

The Blackdome Mine is an underground gold mine that was last operated by J-Pacific Gold (name changed to Sona Resources Corporation in January 2010) from approximately October 1998 to May 1999. The mine is currently operating on a care and maintenance basis.

Les Galbraith, P.Eng., of Knight Piésold completed an inspection of the TSF and associated works on October 9, 2014 in the company of Nick Ferris of Sona Resources. The 2014 inspection involved visual observations of the TSF and surrounding surface runoff diversion works, as well as obtaining water level readings from piezometers and flow measurements from weirs. The results of the 2014 inspection are as follows:

- The TSF embankment appeared to be in good condition. No signs of deformation were identified on the TSF embankment.
- The fundamental water management objectives for the facility during the care and maintenance period are to keep the tailings pond as low as possible. This is successfully being achieved by diverting clean surface water from the 1870 portal around the TSF via the South Diversion Ditch and by diverting water from the 1920 portal around the tailings facility via a ditch on the access road to the 1920 portal.
- Surplus water in the TSF is routed through a spillway, which was in good condition and showed no signs of erosion. The TSF spillway was designed to pass the 200 year 24-hour storm event. There was no water flowing through the spillway at the time of the inspection.
- The TSF currently has 4.3 m of freeboard, which is approximately 3.2 m more than the Stage 4 design as mine operations were suspended in 1999 prior to the additional storage capacity provided by the Stage 4 embankment raise was fully realized.
- The elevation of the tailings pond increased slightly (approximately 0.1 m) compared to observations from the 2013 inspection. The water level is within the range observed in previous inspections.
- The water levels in the standpipe piezometers and the vibrating wire piezometers are similar to previous measurements. There are no concerns with the standpipe or vibrating wire piezometer data.
- The flows measured in Weirs No. 1, No. 2 and the Lou Creek Weir are similar to previous measurements. The flows in the three weirs were clear.

The tailings embankment and surface water diversion works appeared to be operating as designed with no concerns identified during the 2014 inspection. However, the site conditions must be re-evaluated prior to either resuming operations at the mine or shutting the mine down for closure.

Recommendations from the 2014 DSI include:

- Continue with regular inspections of the dam and monitoring of the dam instrumentation
- Developing an OMS Manual as per the CDA guidelines, and
- Schedule a DSR for 2015. The recommended frequency for DSR's for a dam with a "Significant" classification is every 10 years. The DSR will include confirmation of the appropriate AEP's for a dam with a "Significant" classification. The suggested AEP's for a dam with a "Significant" classification are between 1/100 and 1/1000 for both the flood and earthquake events.

4 – REFERENCES

CDA - Canadian Dam Association, Dam Safety Guidelines 2007 (revised 2013).

CDA - Canadian Dam Association, “Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams, 2014.

Claimstaker Resources Ltd. Blackdome Mine Tailings Storage Facility, Report on Design of Stage 4 Expansion (Ref. No. 10832/2-1), August 31, 1998.

Sona Resources Corporation. Blackdome Mine Tailings Storage Facility, Report on 2013 Annual Inspection (Ref. No. VA 101-70/14-1), November 15, 2013.

5 – DECLARATION

In preparation of this report, I, Les Galbraith, hereby certify that:

1. I was a Consulting Engineer with Knight Piésold at the time of the inspection and compilation of the project.
2. I am a graduate of the University of British Columbia, with a B.A. Sc. in Civil Engineering (1995).
3. I am a member in good standing as a Professional Engineer, in the Association of Professional Engineers and Geoscientists of the Province of British Columbia.
4. I have practiced my profession as a geotechnical engineer since 1996.
5. I have had experience in many geotechnical investigation projects and am qualified to prepare this report.
6. This report was prepared by me on behalf of Knight Piésold Ltd. for Sona Resources Corporation. To prepare this report, a review of, and reliance on, the work of other experienced specialist professionals that, although not supervised by me, was considered to be reliable enough on the basis of my own experience and their respective qualifications and reputations to accept their work for the purposes of this technical evaluation.
7. I have no interest in the company Sona Resources Corporation, nor do I intend to do so.
8. I consent to the filing of the attached technical report VA101-70/15-1, entitled "2014 Annual Inspection" to the written disclosure of the technical report and of extracts from or a summary of the technical report in the written disclosure being filed according to National Instrument 43-101.

Les Galbraith, P.Eng.
Specialist Engineer/Project Manager

6 – CERTIFICATION

This report was prepared, reviewed and approved by the undersigned.

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
L.J. GALBRAITH
25493
19/11/14

Prepared: ______________________________
Les Galbraith, P.Eng.
Specialist Engineer/Project Manager

Reviewed ______________________________
Graham R. Greenaway, P.Eng.
Specialist Geotechnical Engineer

Approved: ______________________________
Ken Brouwer, P.Eng.
President

APPENDIX A

SITE PHOTOGRAPHS

(Pages A-1 to A-9)

PHOTO 1 – View of tailings pond and embankment crest.

PHOTO 2 – View of tailings beach and upstream face of embankment looking west.

PHOTO 3 – View of tailings beach and upstream face of embankment looking east.

PHOTO 4 – – View of tailings embankment downstream slope looking east.

PHOTO 5 – View of tailings embankment downstream slope looking east.

PHOTO 6 – View of flow through Weir 1 located downstream of TSF embankment.

PHOTO 7 – View of flow through Weir 2 located on east side of TSF embankment.

PHOTO 8 – View of Seepage Collection and Recycle Pond.

PHOTO 9 – View of flow through Lou Creek Weir located downstream of the Seepage Collection and Recycle Pond.

PHOTO 10 – View of spillway on left abutment looking downstream.

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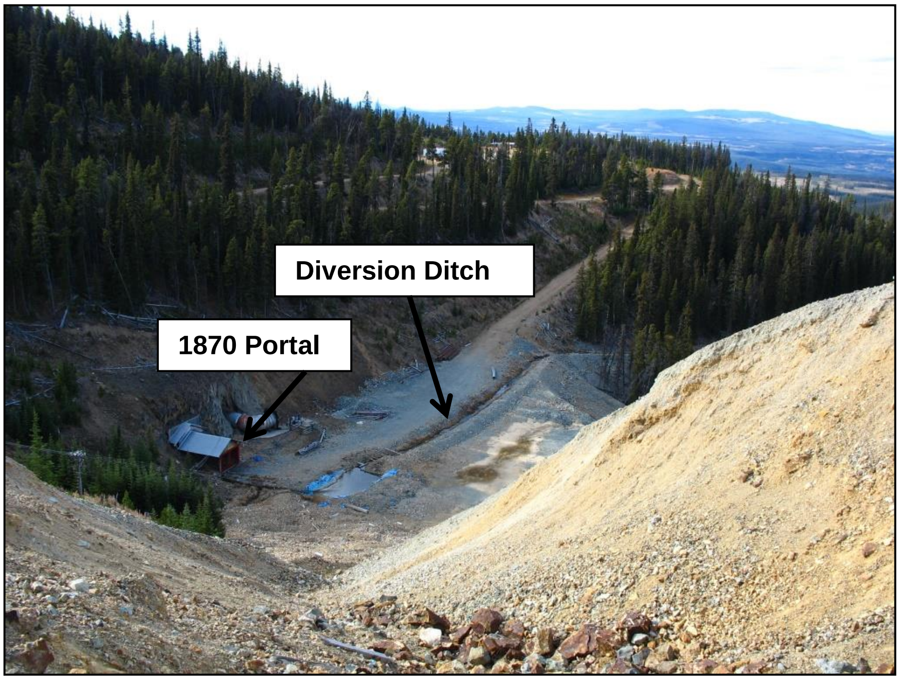

PHOTO 11 – View of diversion ditch from 1870 Portal.

PHOTO 12 – View of Embankment Crest from south end of the facility.

PHOTO 13 – South Diversion ditch looking downstream.

PHOTO 14 – Flow from upstream drain discharge pipe.

PHOTO 15 – TSF looking upstream from crest near right abutment.

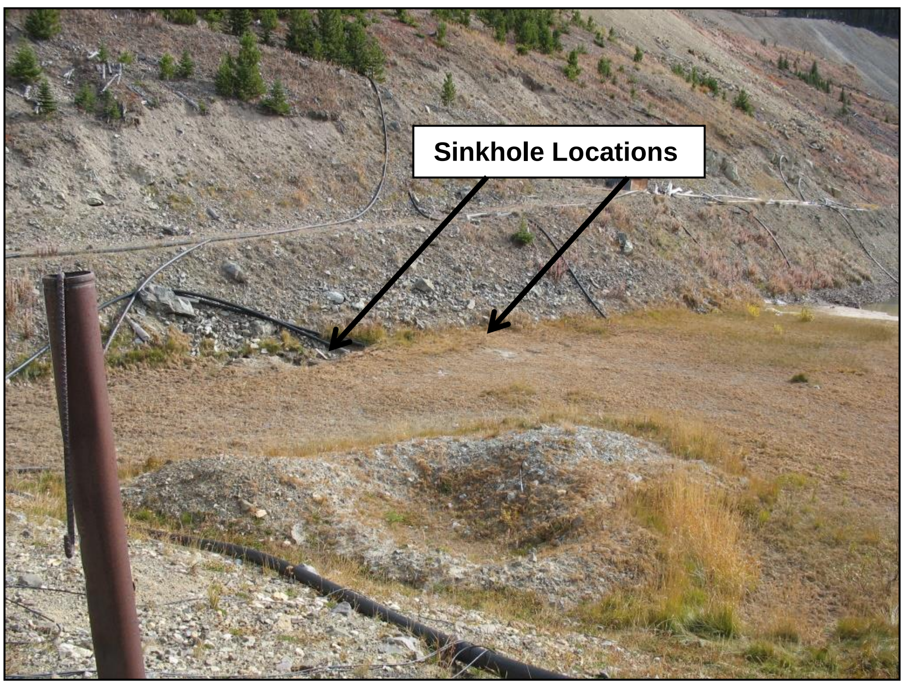

PHOTO 16 – Tailings beach near right abutment where sinkholes have been previously identified.

PHOTO 17 – Downstream slope of TSF embankment with Seepage Collection and Recycle Pond in foreground. Photo from 2012.

APPENDIX B

1998 STABILITY ASSESSMENT

(Pages B-1 to B-7)

4.6 EMBANKMENT STABILITY ANALYSES

4.6.1 General

Embankment stability analyses were conducted using the limit equilibrium computer program SLOPE/W. This program performs a systematic search to obtain the minimum factor of safety from a number of potential slip surfaces. Factors of safety were computed using Spencer's Method of Slices.

Downstream Stability - Analyses were performed to investigate the downstream stability of the Stage 4 Embankment for the following conditions:

- Static conditions during operations. A minimum factor of safety of 1.3 is required for this case.

- Earthquake (pseudostatic) loading during operations. The stability of the embankment under earthquake loading was analyzed by applying a horizontal seismic coefficient (acceleration) to the potential sliding mass. Factors of safety greater than 1.0 imply that there will be no significant deformation of the embankment initiated by earthquake loading. Both the Operating Basis Earthquake (OBE) and the Maximum Design Earthquake (MDE) were evaluated.

- Post-liquefaction (residual tailings strength) condition. SRK-Robinson conducted an extensive evaluation of the liquefaction potential of the existing foundation tailings underlying the Stage 3 embankment raise (1988 expansion). The study concluded that the unconsolidated, saturated tailings beyond the zone of the wick drains would have moderate to high liquefaction potential during seismic loading. The treated tailings beneath the Stage 3 raise would have a moderate to low probability of liquefaction. Thus, in the current analyses, the tailings beyond the Stage 3 raise were assigned a residual strength of $S_u/p' = 0.1$ and the tailings beneath the Stage 3 raise maintained their effective strength parameters. A factor of safety of at least 1.1 is required to prevent against the development of a flow slide after an extreme seismic event.

During operations, the tailings beach and upstream longitudinal drain will result in a depressed phreatic surface along the upstream face of the embankment (Case 2). However, a worst case condition with an elevated phreatic surface within the embankment core zone has also been evaluated (Case 1).

Upstream Stability - The upstream stability of the embankment has also been evaluated for Stage 4 for the worst case condition during construction.

4.6.2 Material Parameters and Assumptions

The following parameters and assumptions which were used in the stability analyses are based on information provided in the February 16, 1998 report by Robinson, Dames & Moore:

- Bulk unit weights and effective strength parameters for the embankment and foundation materials are consistent with previous test work and stability analyses.

- The tailings mass beneath the Stage 3 (1988 Expansion) which was consolidated with wick drains was assigned a higher unit weight and effective friction angle. Tailings upstream of this zone were assigned a lower unit weight and shear strength.

- Due to the dense nature of the foundation soils at the site, the amplification of seismic waves as they propagate from bedrock to the ground surface is not likely to be significant. Case studies have shown that ground motion amplification is negligible through dense soil deposits overlying bedrock. Therefore, maximum bedrock ground motion parameters have been assumed at the base of the embankment.

The geometry, material parameters and location of the phreatic surface for the stability analyses are illustrated on Figure 4.9.

4.6.3 Results of Analyses

Downstream Stability - For the static case during operations with a conservative phreatic surface (Case 1) a minimum factor of safety of 1.5 was calculated. Figure 4.10 shows the critical slip surface for this case as well as the results for the other scenarios analyzed. For Case 2, which models the phreatic surface with an operational seepage collection system, a minimum factor of safety of 1.7 was calculated. The minimum required factor of safety during operations is 1.3. The minimum required factor of safety for post closure is 1.5, which the present embankment configuration satisfies. Thus, no buttressing or other remedial actions would be necessary to attain the required factor of safety if no further embankment raises are completed.

For the pseudostatic analyses, both the Operating Basis Earthquake (OBE) and the Maximum Design Earthquake (MDE) were considered. Seismic coefficients are consistent with those used in previous stability analyses by the former design engineers. For the OBE, a coefficient of 0.063 corresponds to a return period of 475 years. For the MDE, a coefficient of 0.15 corresponds to the Maximum Credible Earthquake (MCE). For the OBE a minimum factor of safety of 1.2 was computed for Case 1 and a minimum factor of safety of 1.5 was computed for Case 2. For the MDE a minimum factor of safety of 1.0 was computed for Case 1 and a minimum factor of safety of 1.2 was computed for Case 2. It should be noted that even for a seismic coefficient of 0.15, representing the MDE, the minimum factor of safety is greater than one which implies that the embankment will be stable with no deformation.

The post liquefaction case incorporates the lower bound steady state strength of the tailings after degradation by in-situ straining. Such a condition can occur if liquefaction is initiated in the material after rapid static or seismic loading causes a significant increase in pore pressure. A factor of safety of 1.5 for Case 1 and 1.7 for Case 2 was calculated. These results indicate that the embankment is not dependent on tailings strength to maintain overall stability and that the embankment has an adequate factor of safety against flow sliding.

Upstream Stability - The minimum upstream static factor of safety for the Stage 4 embankment during construction is 1.9. This value will increase further once tailings deposition commences. Under seismic loading conditions for the Operating Basis Earthquake, a minimum factor of safety of 1.7 was computed. For the Maximum Design Earthquake a minimum factor of safety of 1.4 was computed, even though the probability of occurrence of such an event during Stage 4 construction is extremely low. However, even for these worst case conditions the minimum factor of safety is maintained.

Pore pressures will be routinely measured during construction of the Stage 4 raise using piezometers installed into the embankment fill, the tailings beaches and the foundations. Additional stability analyses will be required if any on-going embankment raises are deemed to be possible.

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CLAIMSTAKER RESOURCES LTD.
BLACKDOME MINE
TAILINGS STORAGE FACILITY: STAGE 4 EXPANSION

MATERIAL PARAMETERS USED FOR STABILITY ANALYSES

Layer Number	Material	Unit Weight, γ (kN/m³)	Effective Cohesion, c´ (kPa)	Effective Friction Angle, φ´ (deg.)
1	Tailings - Low Strength	17.0	0	20
	Tailings - Liquefied	17.0	$S_u/p' = 0.1$	
2	Tailings - High Strength	17.6	0	33
	Embankment Fill (Glacial Till)			
3	Stage 4, 1998 Extension	22.4	21.0	38
4	Stage 3, 1988 Extension	22.4	21.0	38
5	Stage 2, 1987 Extension	22.4	21.0	38
6	Stage 1, 1985 Starter Dam	22.1	31.5	30
7	1991 Reclamation Material	23.7	0	40
8	Gravel Blanket	23.7	0	40
9	Filter	23.7	0	40
10	Drain Material	23.7	0	40
11	Foundation Soil	22.9	35.0	35
12	Bedrock	23.9	50.0	40

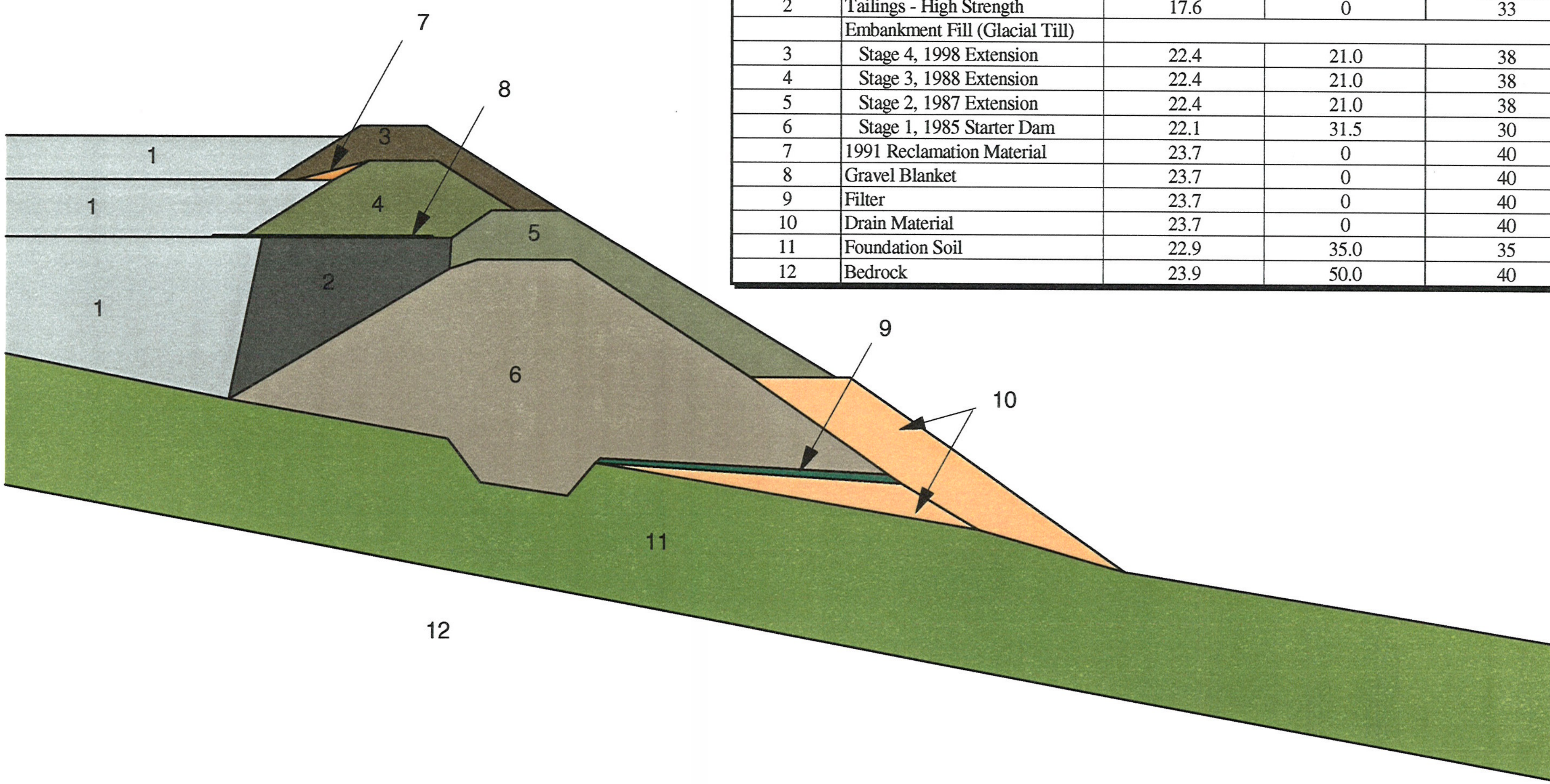

FIGURE 4.9

KNIGHT PIESOLD LTD.
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CLAIMSTAKER RESOURCES LTD.
BLACKDOME MINE
TAILINGS STORAGE FACILITY: STAGE 4 EXPANSION

DOWNSTREAM STABILITY RESULTS

Condition	Case 1	Case 2	Minimum Required
Static Stability	1.5	1.7	1.5
Operating Basis Earthquake (a=0.063g)	1.2	1.5	1.2
Maximum Design Earthquake (a=0.15g)	1.0	1.2	1.0
Post Liquefaction	1.5	1.7	1.0

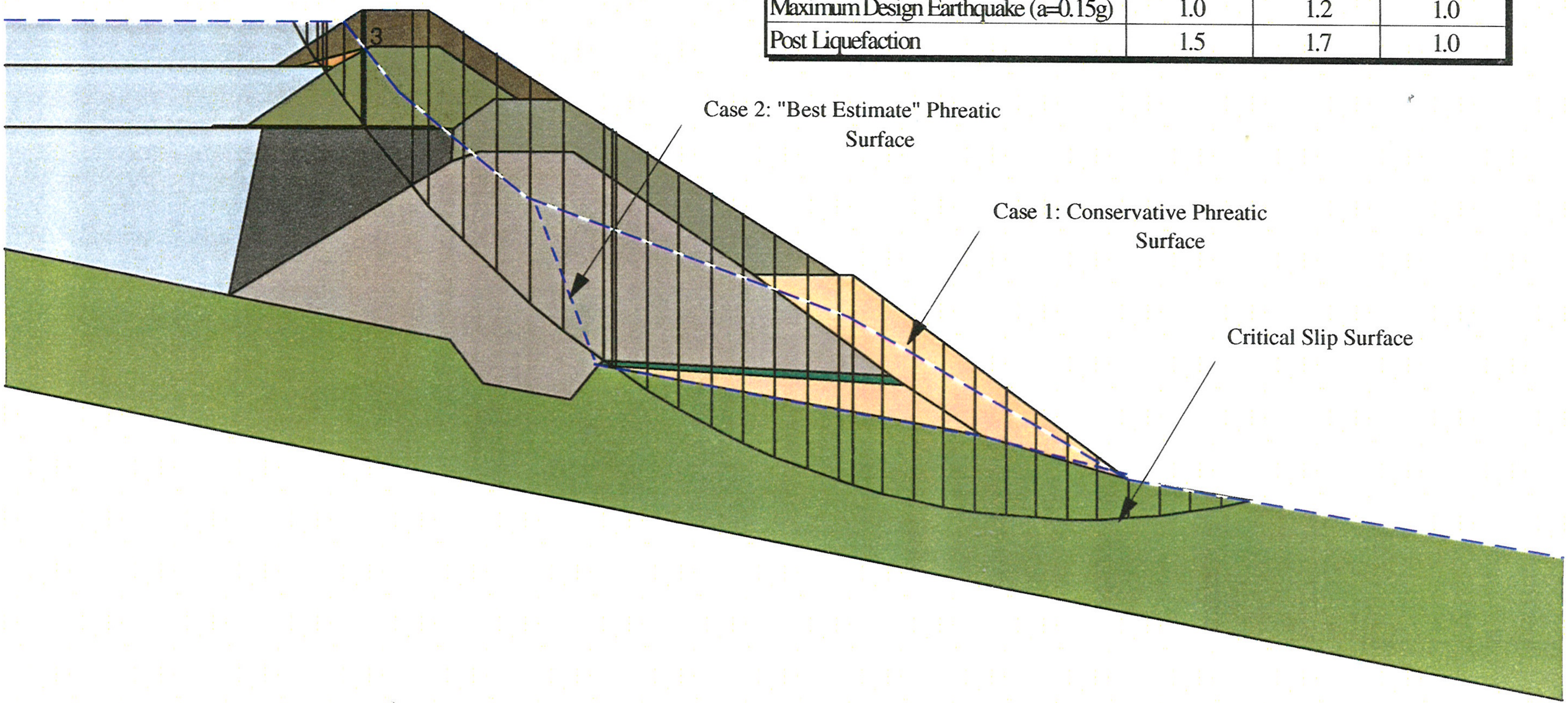

FIGURE 4.10

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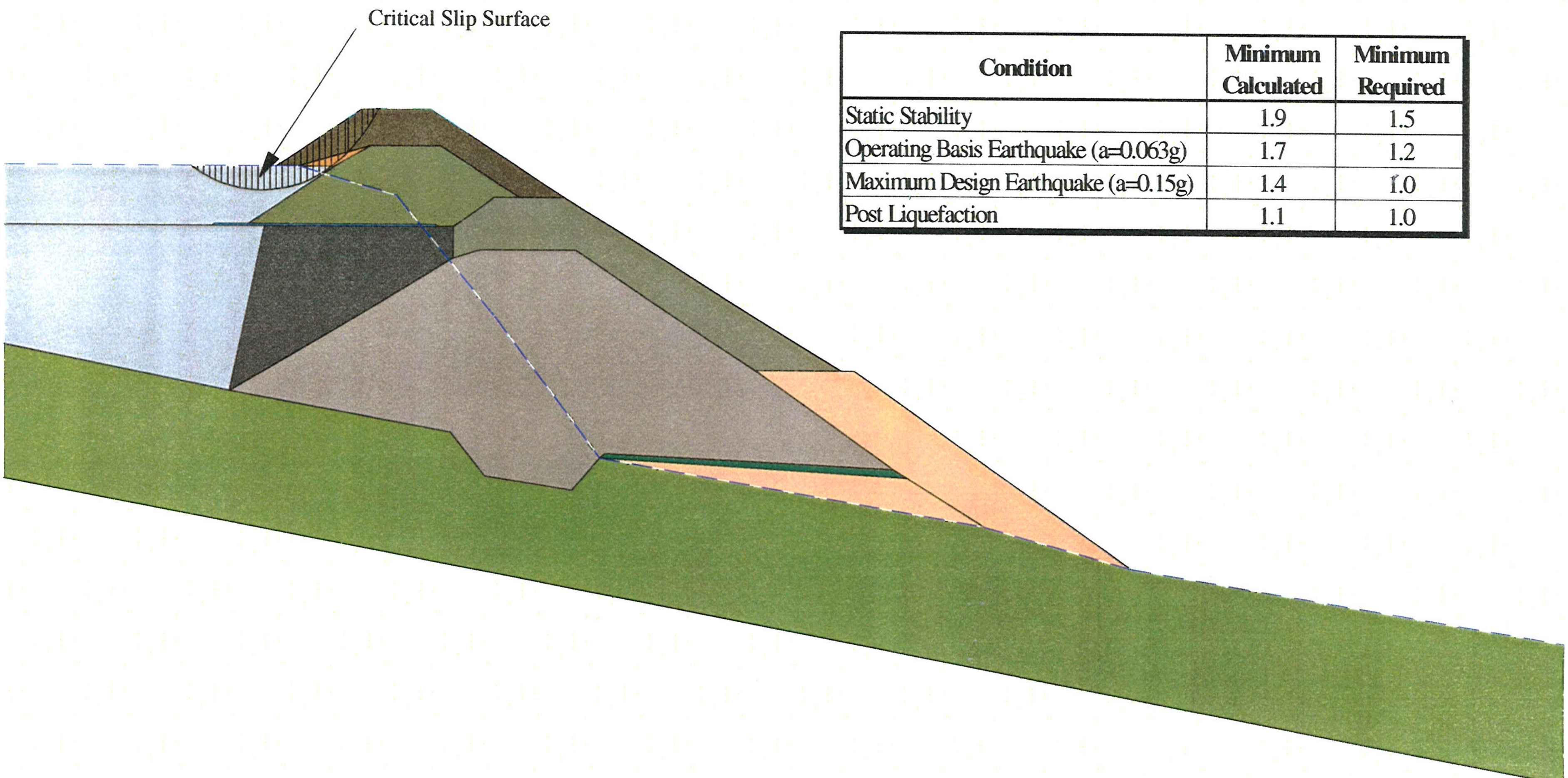
BLACKDOME MINE
TAILINGS STORAGE FACILITY: STAGE 4 EXPANSION

UPSTREAM STABILITY RESULTS



Condition	Minimum Calculated	Minimum Required
Static Stability	1.9	1.5
Operating Basis Earthquake (a=0.063g)	1.7	1.2
Maximum Design Earthquake (a=0.15g)	1.4	1.0
Post Liquefaction	1.1	1.0

FIGURE 4.11