



December 4, 2015

Mr. Paul Brugger, P.Eng.
Barrick Gold Corporation
1084 County Rd 8
Campbellford, ON K0L 1L0

Re: **Project No. THB-00090132-EG**
2015 Tailings Dam Examination
Cullaton Lake Gold Mine, Nunavut
Licence 1BR-CUL1118

Dear Sirs:

Further to your authorization we have carried out a visual examination of the tailings impoundment facility at the above noted site, owned by Barrick Gold Corporation (Barrick). The field examination was performed on September 3, 2015. The attached Dwg. No. 1 in Appendix A, (January 30, 1995) illustrates the general layout of the facility.

As requested by the Nunavut Water Board in a letter to Barrick dated June 9, 2004, commenting on the 2003 Tailings Dam Examination report, the report has been restructured to include a brief history and summary of previous inspection findings and concerns. Annual reports since then have been similarly presented.

Additionally, and in accordance with Licence Amendment No. 1 (Part C, Item 1(e)), dated June 6, 2005), this report comments on the following; *"Monitoring of the encapsulated Shear Lake Waste Rock "cap" for erosion shall be carried out until such point that vegetation is sufficiently established so as to stabilize the cap and preclude significant erosion thereof."*

Historical Summary

The site of the Cullaton Lake Gold Mine is located in Nunavut at approximately 61°16' north latitude and 98°30' west longitude. The site is geographically located relative to the following communities:

- 670 km north of Thompson, Manitoba
- 250 km west of Arviat, N.W.T.
- 416 km south of Baker Lake, N.W.T.
- 416 km northwest of Churchill, Manitoba

The site is at the tree line and in the zone of discontinuous permafrost.

Access to the property is normally gained by charter air flights from Thompson or Churchill, Manitoba to the 1460 m gravel airstrip located about 8 km north of the mill site.

The mine site area features undulating terrain with shallow surficial soils overlying bedrock. The surficial deposits consist mainly of a bouldery glacial till with localized surface organic deposits. The soil matrix of the glacial till is a well-graded, silty sand with no clay to traces of clay (i.e., exhibit little or no plasticity).

The Cullaton Lake Gold Mine's construction and mill startup of a 300 tonnes per day complex was completed in early fall of 1981 with its first gold pour in December 1981. Total gold produced from the B-Zone and the Shear Lake zones to August 1985, was over 100,000 ounces when, for economic reasons, it was decided to put the property on temporary closure on a care-and-maintenance basis. The property has remained closed since September 1985.

Based on the mill records, a total of 373,000 tonnes of ore was processed, of which approximately 150,000 tonnes came from the B-Zone with the balance of 223,000 tonnes coming from the Shear Zone. Laboratory analyses previously showed that the tailings from the B-Zone have a relatively high acid generation potential; however, there was no evidence, either physical or chemical, that acid drainage had been taking place within the tailings impoundment area. This lack of effect is attributed to three main factors:

- The majority of the tailings are either submerged below water and/or saturated, such that there is a lack of oxygen required for oxidation;
- The tailings are frozen for about eight months of the year and only the top layer of the tailings thaws. This, and the fact they remain saturated, limits water movement through the tailings, with resulting limited oxidation;
- The acid kinetic reaction from the tailings impoundment becomes substantially diluted and is not detectable in the surrounding environment.

The principal concern of the Water Board, with respect to abandonment of the tailings impoundment facility, was the potential generation of acidic drainage. As part of the Closure Plan¹, the objectives were to minimize acid generation by:

- Maintaining water cover over the tailings within the pond to prevent access by oxygen;
- Placement of cover material over the exposed tailings to reduce access by oxygen;
- Maintaining the remaining tailings in a frozen state (permafrost), by thickening the cover material.

The homogeneous tailings dams were constructed in the late 1970s or early 1980s (presumably) with local silty sand and gravel till (there are no design or construction records). Maximum dam height was about 5.5 m above original ground. The dams included filter fabric and synthetic impermeable liners on the upstream faces.

¹ Abandonment and Restoration Plan, Cullaton Lake Gold Mines Ltd. Reference No. F-90132-A/E. May 7, 1991. Prepared for Corona Corporation by Trow Consulting Engineers Ltd.

The following inspections of the tailings dams and ponds have been performed and reported on by **exp** and **Trow Associates Inc.** (a former identity of **exp** Services Inc.) since the preparation of the Closure Report. Note that ownership of the property has changed over the years. These reports should be on file with the Water Board and with Barrick.

August 1992 Inspection – Reported to Homestake Canada Ltd. (March 15, 1993)

The attached Drawings, No. 1 to 4 (Appendix B), are reproduced from the 1992 inspection report and serve to illustrate the conditions at the time. Observations with respect to the tailings impoundment included:

- the Pond No. 1 spillway exceeds the design requirements (wider channel and flatter slopes) given in the Closure Plan and was constructed with non-woven filter fabric on the cohesionless subgrade soil and covered with a rubber liner and about a 300 mm thick layer of graded waste rock;
- a few minor seeps were observed on the downstream side of Dam No. 1;
- no recommendations were made other than to conduct a detailed site survey.

June 1994 Inspection – Reported to Homestake Canada Ltd. (February 1, 1995)

A detailed survey of the tailings impoundment area and structures was completed. Observations with respect to the tailings impoundment included:

- the pond elevations of Pond No. 1 and No. 2 were 94.0 m and 89.4 m, respectively;
- no seepage evidenced on the downstream side of either dam;
- spillways in good condition;
- dams appear stable;
- no evidence of exposed tailings in Tailings Area No. 1;
- no recommendations were made.

September 1996 Inspection – Reported to Homestake Canada Ltd. (November 27, 1996)

Observations with respect to the tailings impoundment included:

- the tailings dams are presently stable, and in good condition with no signs of distress or erosion;
- although there were a few wet areas near the downstream toe of Dam No. 1, no seeps were visible; wetness may have been due to recent rainfall accumulations;
- the water level in Pond No. 1 was the same as it was in 1994;
- there were no exposed tailings in the area;
- it was recommended that some minor repair work be undertaken to address the exposed liner at the Dam No. 1 spillway, and that damaged and exposed sections of liner be removed from Dam No. 2.

July 1999 Inspection – Reported to Homestake Canada Ltd. (October 13, 1999)

Observations with respect to the tailings impoundment included:

- some small erosion scars were observed on both upstream and downstream sides of Tailings Dam No. 1, likely due to erosion of the previously flattened slopes;
- upstream and downstream slopes of about 3H:1V and 6H:1V, respectively, and crest width varies up to 15 m;
- Pond No. 1 level about 93.7 m, slightly lower than the 94.0 m of previous inspections;
- no unsubmerged tailings observed;
- no seepages observed at either dam;
- both dams considered stable;
- no recommendations were made.

July 2001 Inspection – Reported to Homestake Canada Ltd. (February 6, 2002)

Observations with respect to the tailings impoundment included:

- similar observations as in 1999, except Pond No. 1 water level was about 0.3 m higher at elevation 94.0, similar to previous years;
- no recommendations were made.

July 2003 Inspection – Reported to Barrick Gold Inc. (October 15, 2003)

- similar observations as in 2001;
- the erosion scars previously identified in 1999 appear to be naturally revegetating and self-armouring with larger rock particles from the dam fill;
- the weir in the Dam No. 1 spillway had been removed subsequent to the 2001 inspection;
- no recommendations were made.

July 2004 Inspection – Reported to Barrick Gold Inc. (February 9, 2005)

- similar observations as in 2003;
- the erosion scars previously identified appeared to be continuing to revegetate naturally and to self-armour with larger rock particles from the dam fill;
- a recommendation to repair the rubber liner and restore the design configuration of the base of the Dam No. 1 spillway channel was made.

August 2005 Inspection – Reported to Barrick Gold Inc. (October 3, 2005)

- similar observations as in prior recent years;
- the erosion scars previously identified appeared to be continuing to revegetate naturally and to self-armour with larger rock particles from the dam fill;
- local fine rockfill (25 mm to 75 mm size) was sourced and placed in the Dam No. 1 spillway channel to cover much of the exposed rubber liner that was previously evident in a few locations. Up to about 100 mm thickness was placed and it was recommended that this be monitored during future inspections.

August 2006 Inspection – Reported to Barrick Gold Inc. (October 11, 2006)

- similar observations as in prior recent years;
- the previously identified erosion scars on Dam No. 1 appeared to be continuing to revegetate naturally and to self-armour with larger rock particles from the dam fill. No new erosion was apparent;
- the pond level in Pond No. 1 was about 100 mm to 150 mm lower than in 2005, due to a relatively dry period. There was no flow over the Dam No. 1 spillway;
- no erosion of the fine rockfill placed on the spillway in 2005 was observed;
- no seepages through the dam were observed;
- no exposed tailings were observed within the pond;
- vegetation on the till cap on the Shear Lake Waste Rock continues to improve.

July 2007 Inspection – Reported to Barrick Gold Inc. (February 11, 2008)

- similar observations as in prior recent years;
- the previously identified erosion scars on Dam No. 1 appeared to be continuing to revegetate naturally and to self-armour with larger rock particles from the dam fill;
- no new erosion was apparent;
- the pond level in Pond No. 1 was about 100 mm higher than in 2006 and only a minor trickle was observed at the Dam No. 1 spillway;
- no erosion of the fine rockfill placed on the spillway in 2005 was observed;
- no seepages through the dam were observed;
- no exposed tailings were observed within the pond;
- vegetation on the till cap on the Shear Lake Waste Rock continues to improve.

September 2008 Inspection – Reported to Barrick Gold Inc. (December 16, 2008)

- similar observations as in prior recent years;
- the previously identified small erosion scars on the upstream of Dam No. 1 appeared to be continuing to revegetate naturally and to self-armour with larger rock particles from the dam fill. No new erosion was apparent;
- the pond level in Pond No. 1 was a few centimetres lower than in 2007 and only a minor trickle was observed at the Dam No. 1 spillway;
- no erosion of the fine rockfill placed on the spillway in 2005 was observed;
- no seepages through the dam were observed;
- no exposed tailings were observed within the pond;
- vegetation on the till cap on the Shear Lake Waste Rock continues to improve.

August 2009 Inspection – Reported to Barrick Gold Inc. (October 27, 2009)

- similar observations as in prior recent years;
- the previously identified small erosion scars on the upstream of Dam No. 1 appeared to be continuing to revegetate naturally and to self-armour with larger rock particles from the dam fill. No new erosion was apparent;
- the pond level in Pond No. 1 was a few centimetres higher than in 2008 and only a minor trickle was observed at the Dam No. 1 spillway;
- no erosion of the fine rockfill, that was placed on the spillway in 2005, was observed;
- no seepages through the dam were observed;
- no exposed tailings were observed within the pond;
- flow in the Dam No. 2 spillway channel was slightly less than in 2008;
- vegetation on the till cap on the Shear Lake Waste Rock continues to improve;
- recommendation to reduce monitoring frequency to every three years was made.

August 2010 Inspection – Reported to Barrick Gold Inc. (February 28, 2011)

- similar observations as in prior recent years;
- the previously identified small erosion scars on the upstream of Dam No. 1 appeared to be continuing to revegetate naturally and to self-armour with larger rock particles from the dam fill. No new erosion was apparent;
- the pond level in Pond No. 1 was a few centimetres lower than in 2009 and only a minor trickle was observed at the Dam No. 1 spillway;
- no erosion of the fine rockfill that was placed on the spillway in 2005 was observed;
- no seepages through the dam were observed;

- a wet spot was identified on the downstream slope, south of the spillway. No seepage was observed. The elevation of this spot was about 150 mm to 300 mm below the pond water level. It was recommended to mark this location in the field for future monitoring;
- no exposed tailings were observed within the pond;
- flow in the Dam No. 2 spillway channel was a trickle and slightly less than in 2009;
- vegetation on the till cap on the Shear Lake Waste Rock continues to improve;
- as in 2009, a recommendation to reduce monitoring frequency to every three years was made.

August 2011 Inspection – Reported to Barrick Gold Inc. (December 15, 2011)

- similar observations as in prior recent years;
- the previously identified small erosion scars on the upstream of Dam No. 1 appeared to be continuing to revegetate naturally and to self-armour with larger rock particles from the dam fill. No new erosion was apparent;
- the pond level in Pond No. 1 was a few centimetres lower than in 2010 and only a minor trickle was observed at the Dam No. 1 spillway;
- no erosion of the fine rockfill that was placed on the spillway in 2005 was observed;
- no seepages through the dam were observed;
- at the wet spot, which was previously identified during the 2010 inspection, on the downstream slope south of the spillway, there was no seepage observed, although there was collected water, which may have been from recent precipitation. The elevation of this spot was about 150 mm to 300 mm below the pond water level. The location was marked with a length of rebar, as previously recommended in the 2010 inspection report;
- no exposed tailings were observed within the pond;
- there was no flow observed in the Dam No. 2 spillway channel;
- vegetation on the till cap on the Shear Lake Waste Rock continues to improve;
- as in previous years, a recommendation to reduce the examination (by a geotechnical engineer) frequency to every three years was made.

August 2012 Inspection – Reported to Barrick Gold Inc. (January 23, 2013)

- similar observations as in prior recent years;
- the previously identified small erosion scars on the upstream of Dam No. 1 appeared to be continuing to revegetate naturally and to self-armour with larger rock particles from the dam fill. No new erosion was apparent;
- the pond level in Pond No. 1 was two to three centimetres lower than in 2011 and only a minor trickle was observed through the rockfill at the Dam No. 1 spillway;
- no erosion of the fine rockfill that was placed on the spillway in 2005 was observed;

- no seepages through the dam were observed;
- at the wet spot, which was previously identified (in 2010) on the downstream slope south of the spillway, there was no seepage observed, although there was a minor amount of collected water, which may have been from recent precipitation. The elevation of this spot was about 150 mm to 300 mm below the pond water level and the location was previously marked with a length of rebar.
- no exposed tailings were observed within the pond;
- there was minor flow observed through the rockfill of the Dam No. 2 spillway channel;
- vegetation on the till cap on the Shear Lake Waste Rock continues to improve;
- as in previous years, a recommendation to reduce the examination (by a geotechnical engineer) frequency to every three years was made.

August 2013 Inspection – Reported to Barrick Gold Inc. (February 28, 2014)

- similar observations as in prior recent years;
- the previously identified small erosion scars on the upstream of Dam No. 1 appeared to be continuing to revegetate naturally and to self-armour with larger rock particles from the dam fill. No new erosion was apparent;
- the pond level in Pond No. 1 was two to three centimetres lower than in 2012 and only a minor trickle was observed through the rockfill at the Dam No. 1 spillway;
- no erosion of the fine rockfill that was placed on the spillway in 2005 was observed;
- no seepages through the dam were observed;
- at the wet spot, which was previously identified on the downstream slope south of the spillway, there was no seepage observed, although there was a minor amount of accumulated water, which may have been from recent precipitation. The elevation of this spot was about 150 mm to 300 mm below the pond water level. The location is marked with a length of rebar.
- no exposed tailings were observed within the pond;
- there was no flow observed through the rockfill of the Dam No. 2 spillway channel;
- vegetation on the till cap on the Shear Lake waste rock storage area continues to improve;
- as in previous years, a recommendation to reduce the examination (by a geotechnical engineer) frequency to every three years was made.

August 2014 Inspection – Reported to Barrick Gold Inc. (September 18, 2014)

- similar observations as in prior recent years;
- the previously identified small erosion scars on the upstream of Dam No. 1 appeared to be continuing to revegetate naturally and to self-armour with larger rock particles from the dam fill. No new erosion was apparent;

- the pond level in Pond No. 1 was similar to that in 2013 and only a minor trickle was observed through the rockfill at the Dam No. 1 spillway;
- no erosion of the fine rockfill that was placed on the spillway in 2005 was observed;
- no seepages through the dam were observed;
- at the wet spot, which was previously identified on the downstream slope south of the spillway, there was no seepage observed, although there was a minor amount of accumulated water, which may have been from recent precipitation. The elevation of this spot was about 150 mm to 300 mm below the pond water level and the location is marked with a length of rebar.
- no exposed tailings were observed within the pond;
- there was no flow observed through the rockfill of the Dam No. 2 spillway channel;
- vegetation on the till cap on the Shear Lake waste rock storage area continues to improve;
- as in previous years, a recommendation to reduce the examination (by a geotechnical engineer) frequency to every three years was made.

Current Inspection – September 3, 2015

The field examination was carried out by Mr. Demetri Georgiou, P.Eng., on September 3, 2015. All of the attached photographs were taken on this date, unless otherwise noted.

Aerial photos of the site were not possible due to poor weather (low ceiling) constraints. Photos 1 and 2, attached, show oblique views of the site taken in 2014. The tailings area had been previously covered with local till as reported in Trow's previous inspection reports. Vegetation on the till covered tailings is small and sparse. However, it is noted that the density of the vegetation is increasing gradually, based on the comparative visual observations of previous years.

Tailings Dam No. 1

Photos 3 and 4 show views of Dam No. 1. Typically, the embankment, which is constructed principally with local cohesionless till, is irregular in section and surface grade. Average side slopes of the upstream and downstream sides are typically about 3H:1V and 6H:1V, respectively. The downstream side is estimated to be as steep as about 3H:1V in a few areas. The dam height ranges up to about 4 m. Some small erosion scars were observed on both the upstream and downstream sides; however, as described below, they appear to continue to stabilize with vegetation and self-armouring with larger rock particles from the till and previously placed mine waste rock. These scars do not appear to be increasing in size, based on visual comparisons of previous years. The crest width varies but is generally in the order of 15 m. Within the tailings pond itself, no unsubmerged or exposed tailings were observed.

No seepages were observed on the day of inspection. However, a wet spot, first noted in the 2010 report, was observed about halfway down the downstream slope of the dam (see Photo 5), south of the spillway, at the approximate location shown on Figure 1 in Appendix A. As recommended in a previous report, the location had been marked with a length of rebar. While there was some minor wetness, no accumulated water or flow was visible. There was no evidence of any dam internal soil erosion. This should continue to be monitored during the scheduled inspections.

Photos 6 and 7 show views of the Dam No. 1 spillway channel. Only a minor flow (trickle) was occurring at the spillway as had been observed in most previous years. A minor trickle was observed to flow through the rockfill comprising the channel bottom, about the same as in previous years. The pond level was noted to be about two to three centimetres higher than in 2014. Based on all of the previous inspections, the pond level varies only a few centimetres, from year to year.

Our visual inspection of the spillway channel, where additional fine rockfill was placed in 2005 to cover small areas of previously exposed rubber liner, indicates that no erosion has occurred. It is expected that monitoring of this area during future inspections will indicate that the treatment performed in 2005 is sufficient.

Based on the current, as well as previous, inspections and involvement with the project, Dam No. 1 is not in any distress and is considered to be stable.

Tailings Dam No. 2

Photo 8 shows a view of Dam No. 2, taken in 2014. As with Dam No. 1, the principal construction material is local cohesionless till. The dam section and surface grade is irregular, although less so than Dam No. 1. The crest width varies but is in the order of 15 m.

Photo 9 is an upstream view of the Dam No. 2 spillway channel. There was a small amount of flow observed over the rockfill channel, due to the slightly higher water level of Pond 2, compared to 2014.

Based on the current as well as previous inspections, the dam is not in any distress and is considered to be stable.

Review of Shear Lake Waste Rock Cap

Photos 10 (2014) to 12, inclusive, show views of the Shear Lake Waste Rock Pile. As previously described, an aerial photo of the pile was not possible in 2015, due to poor weather conditions. The Shear Lake Waste Rock Pile, located on the east side of Shear Lake, some 4.5 km north of the former mill site, was reportedly capped with local, compacted glacial till to promote runoff and reduce infiltration. In 2005, Barrick personnel oversaw the re-seeding of the cap. The re-seeding (with grasses) was implemented to promote some vegetation growth which would reduce the erosion of the cover due to runoff, particularly along the side slopes.

Our observations suggest that, while there are some sparse areas, particularly on the top, the vegetation is helping to reduce erosion, in that very few small erosion gulleys/channels (20 to 30 mm deep/wide) were noted on the side slopes. These generally are short and do not extend the full length of the slope. Most of these had been filled to some extent with small granular material in 2005, to minimize further erosion. Our current observations are similar to the previous years. A comparison of the photos from previous years shows that the vegetation is improving, especially on the majority of the side slopes.

Subsequent inspections should be made to verify the efficacy of the vegetation/till cover system. Any erosion gullies that form should be repaired with fine rock/gravel. It is expected that it will take several more years for the vegetation to establish itself fully.

Summary

Based on the numerous visual inspections that **exp** has performed between 1992 and 2015, it is considered that no erosional or other detrimental forces have diminished the integrity of the tailings dams at the Cullaton Lake Mine. The dams are stable and should continue to serve their intended functions of providing storage and water cover for the tailings in Pond No. 1 long into the future.

It is recommended that the condition of the Dam No. 1 spillway channel continue to be monitored for erosion and if any is apparent, remedial measures, such as the addition of additional rockfill, be implemented. In addition, the wet spot noted on the downstream side of Dam No. 1, south of the spillway, should be monitored during each subsequent visit.

While the inspections have been largely qualitative, there has been no visible evidence of deterioration of the dam or spillway structures over the last several years. Accordingly, it is recommended that the frequency of the formal geotechnical inspections be reduced to once every three years. Routine inspections should be provided by Barrick personnel during their annual site visits to collect water samples.

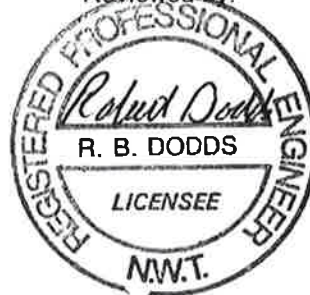
We trust that this letter is sufficient for your current requirements. Should you require clarification of some point, please contact the undersigned.

Sincerely,
exp Services Inc.

Prepared by:

Demetri N. Georgiou, M.A.Sc., P.Eng.
Branch Manager/Principal Engineer

Reviewed by:



Robert B. Dodds, Ph.D, P.Eng.
Senior Consultant

Attach: Photographs
 Appendix A
 Appendix B

PHOTOGRAPHS

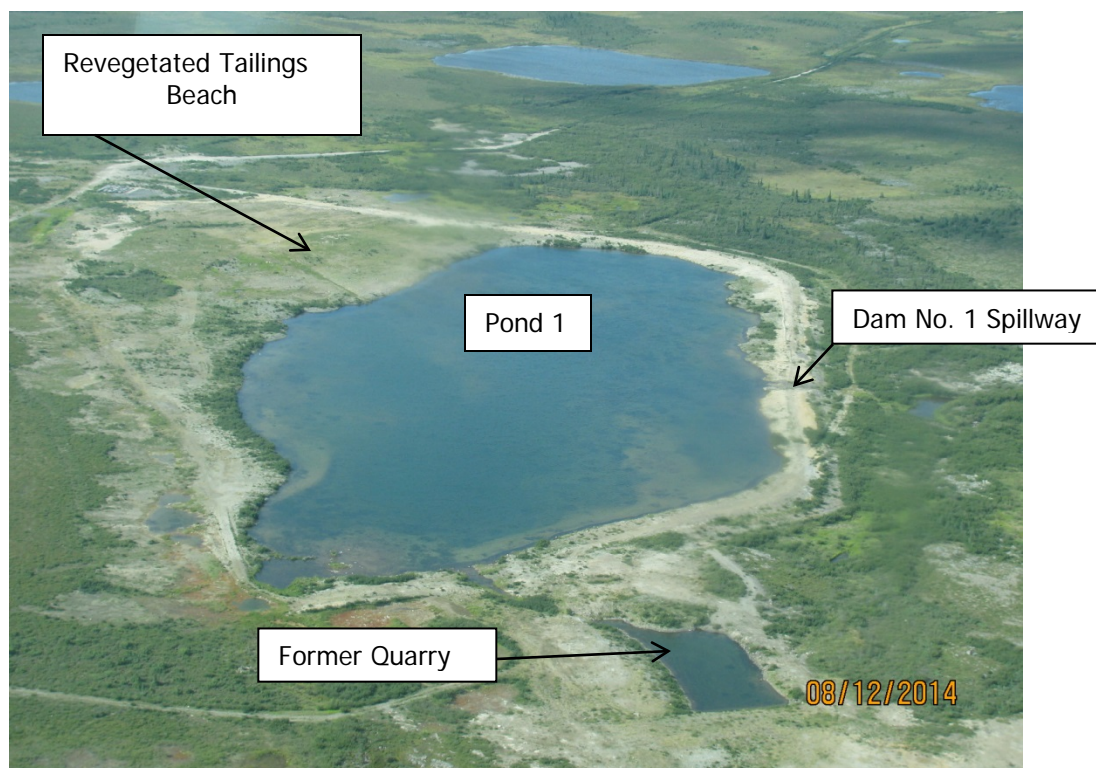


Photo 1: Tailings Pond and Dam No. 1 (on right) looking north (from 2014)



Photo 2: Tailings facility looking roughly southeast (from 2014)



Photo 3: Dam No. 1 – upstream bank looking south



Photo 4: Downstream section of Dam No. 1 at spillway channel



Photo 5: Wet spot on downstream side of Dam No. 1- minor seepage/ponding



Photo 6: Dam No. 1 Spillway inlet and crest



Photo 7: Dam No. 1 Spillway downslope channel



Photo 8: View of Dam No. 2 (on the right) and Pond No. 2 – from 2014.



Photo 9: Dam No. 2 Spillway Channel with flow looking upstream to Pond 2



Photo 10: Aerial view of Shear Lake Waste Rock Pile looking west (2014)

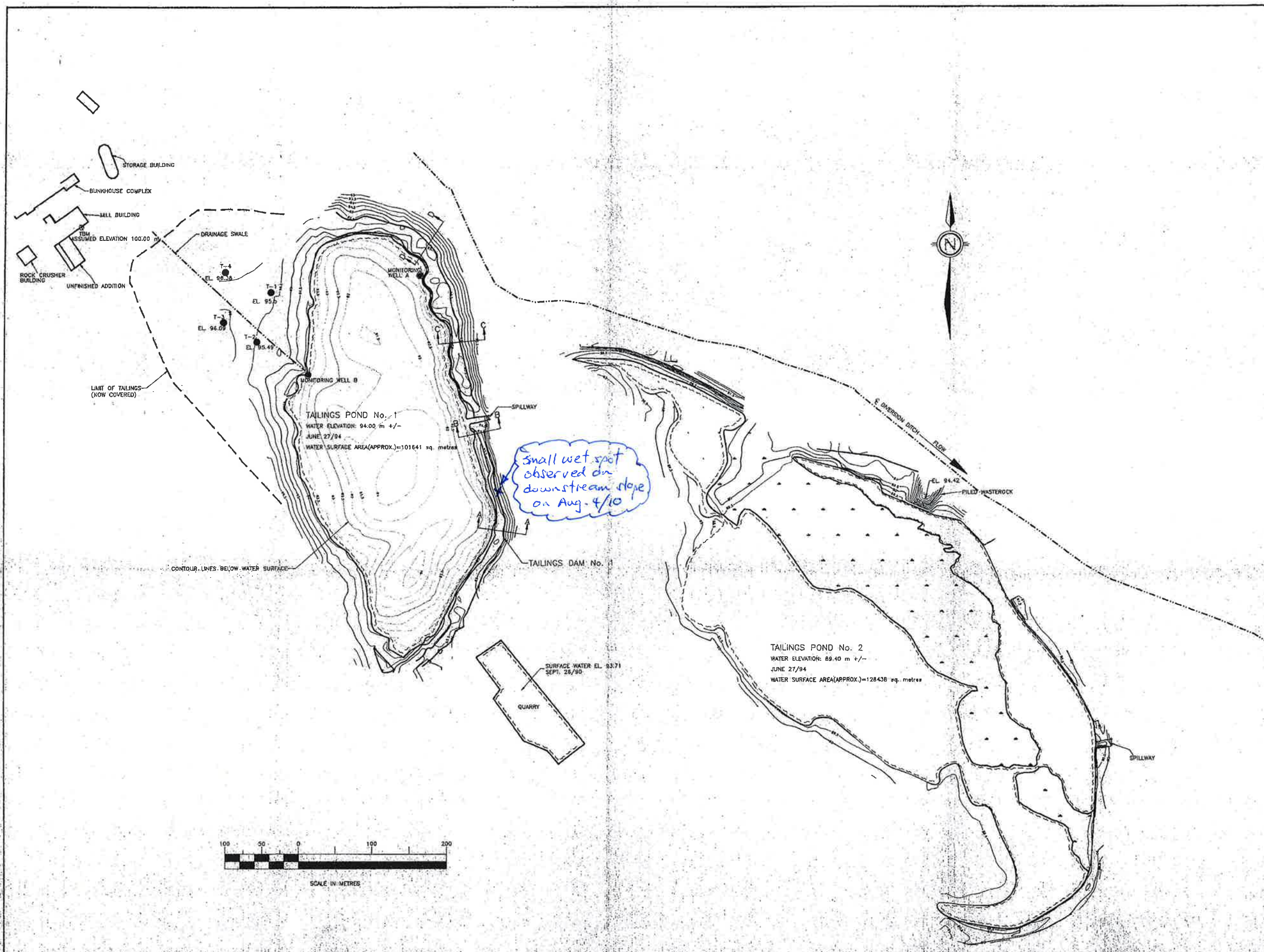


Photo 11: East side of Shear Lake Waste Rock Pile showing grasses on left



Photo 12: Stable gravel/till covered slope on Shear Lake Waste Rock Pile

APPENDIX A



LEGEND

- MONITORING WELL
- BENCH MARK
- THERMOSTERS

NOTES:

1. DATA INTERPRETED FROM TROW ENGINEERING SURVEY (JUNE 27/94) AND SURVEY BY H.I.W. SURVEYS LTD. (NOV. 10/90)
2. BENCH MARK IS LOCATED ON CONCRETE SLAB AT NORTH EAST CORNER OF MILL BUILDING. ASSUMED ELEVATION: 100.00m
3. ALL ELEVATIONS ARE SHOWN IN METRES.

REVISIONS

No.	Date	Revision

Client: HOMESTAKE CANADA

Project: CULLATON LAKE MINE CLOSURE

Title: TAILINGS POND SURVEY
CULLATON LAKE, N.W.T.

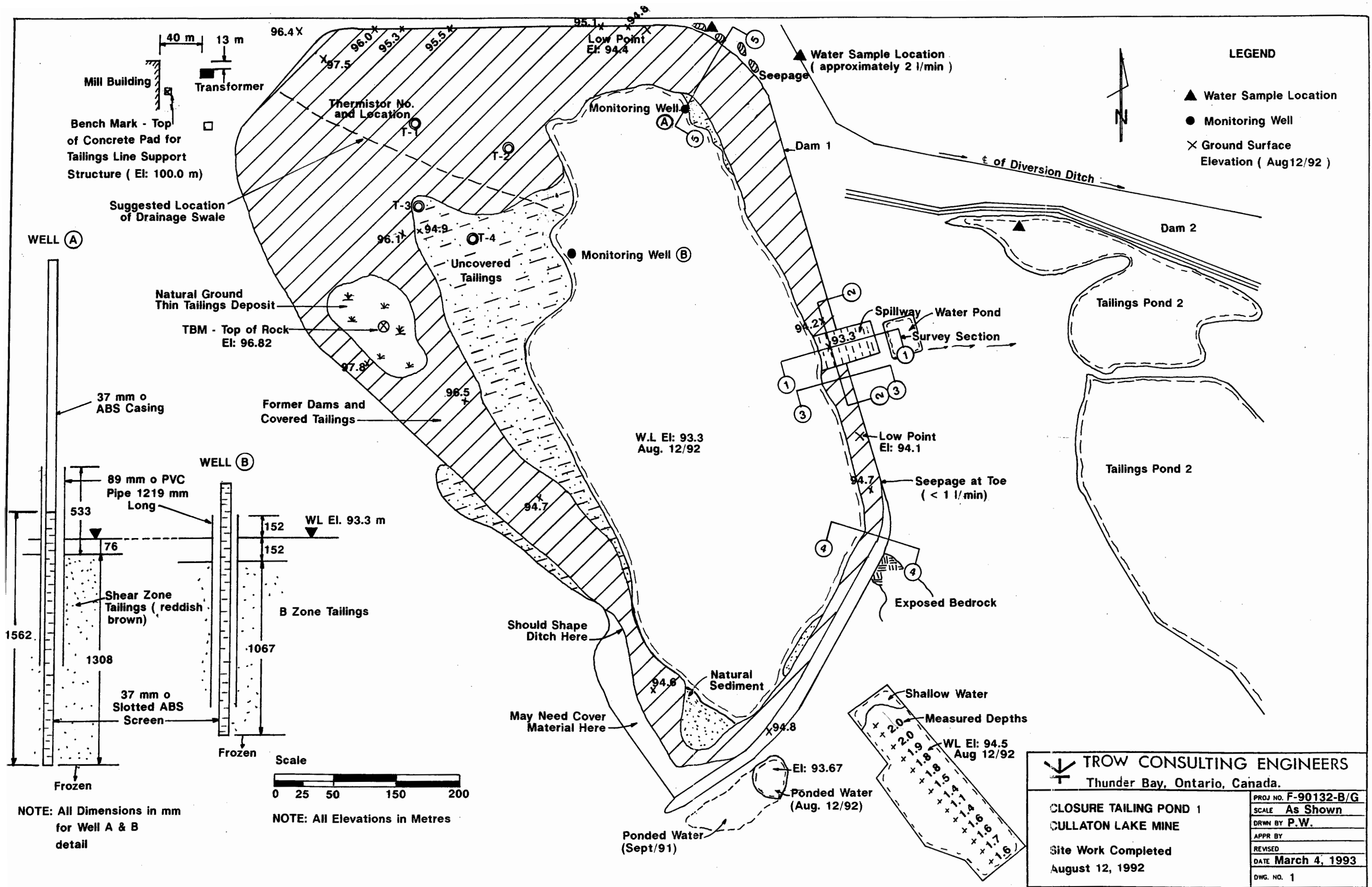
Project No. Dwg. No.:
F-90132-A/G 1

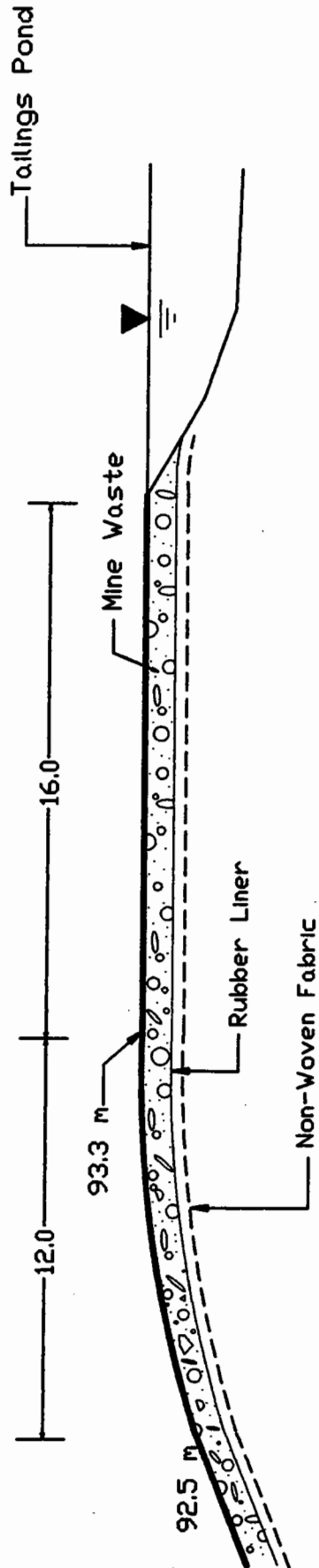
Drawn By: PW/DT Reviewed By: DK

Date: JANUARY 30, 1995

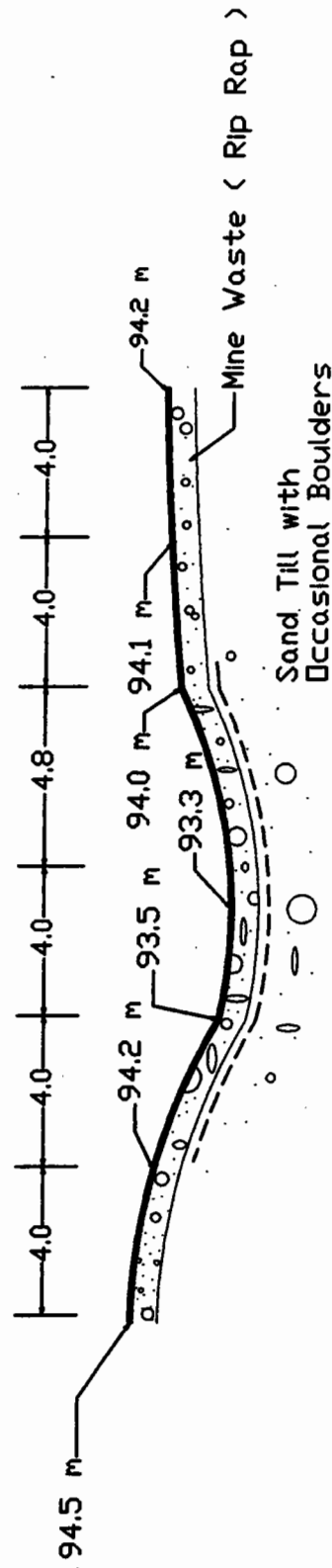
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APPENDIX B





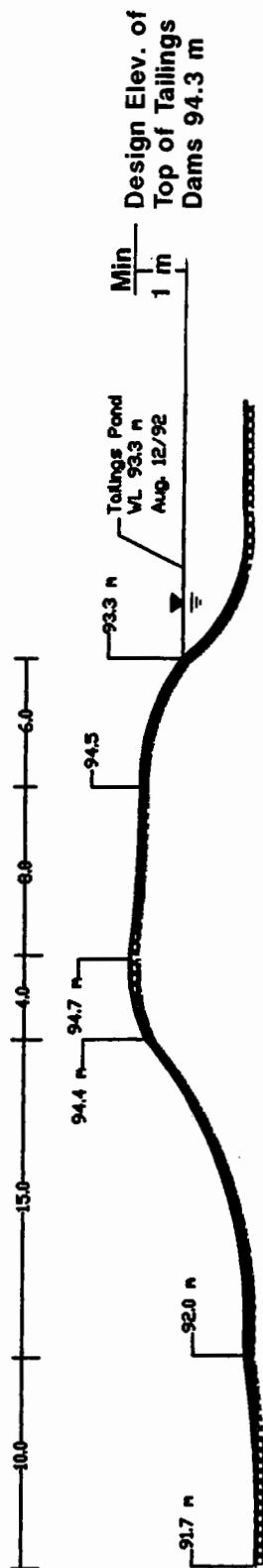
SECTION 1 - Longitudinal (Looking South)



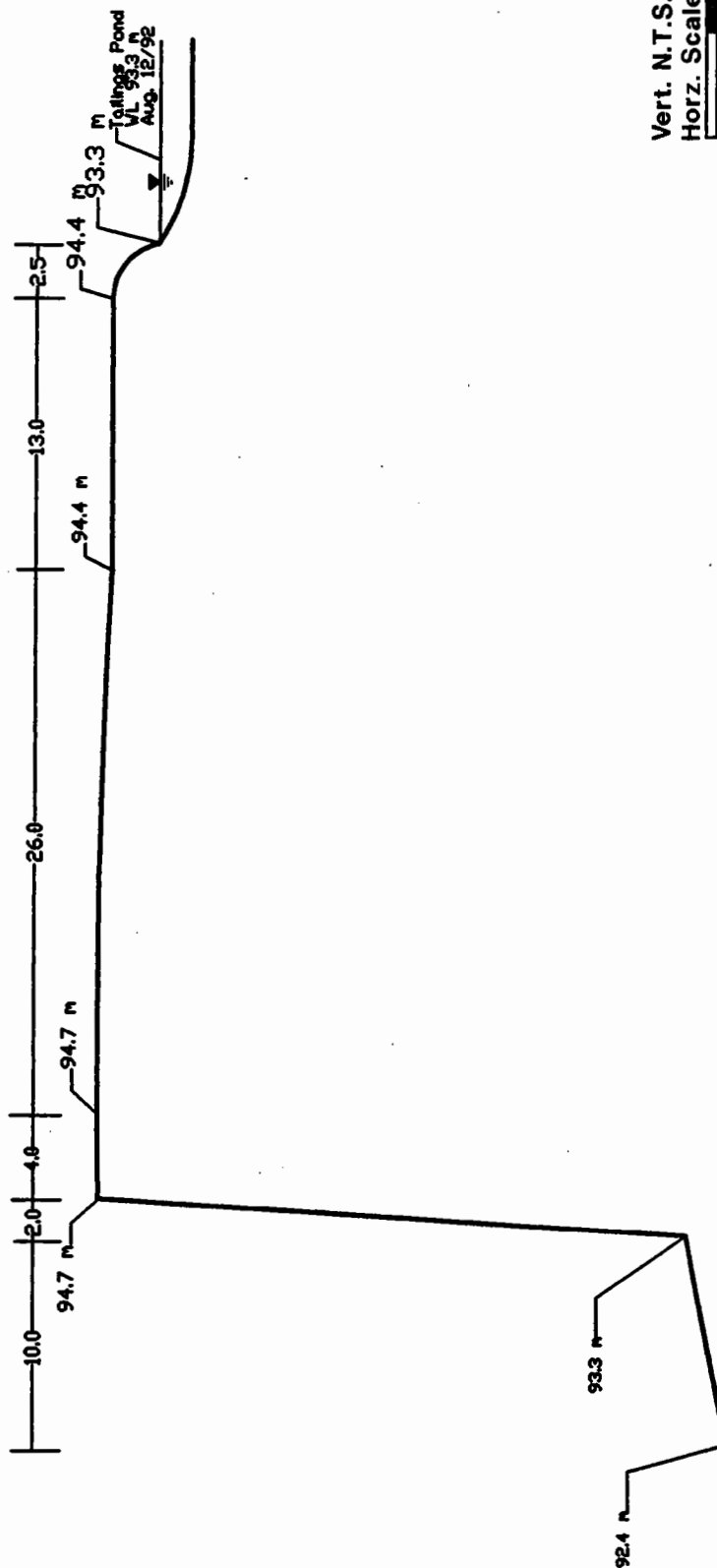
SECTION 2 - Transverse (Looking East)

Vertical N.T.S.
Horizontal Scale



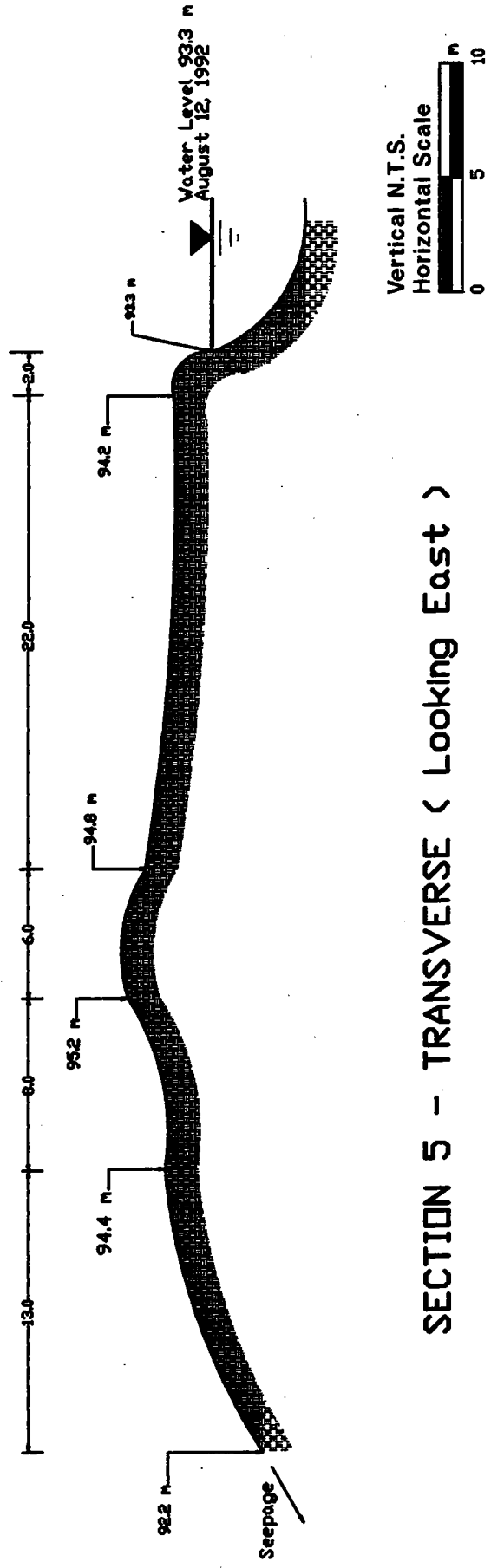


SECTION 3 - TRANSVERSE (Looking South)



SECTION 4 - TRANSVERSE (Looking South)

Vert. N.T.S.
 Horz. Scale
 0 5 10 m



SECTION 5 - TRANSVERSE (Looking East)