REPORT

2020 Annual Inspection

Pine Point Tailings Impoundment Area, Pine Point, NT

Submitted to:

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Executive Summary

This report presents the results of the 2020 annual inspection for the tailings impoundment area (TIA) at the closed Pine Point Mine in the Northwest Territories.

The report was prepared by Golder Associates Ltd. (Golder) at the request of Teck Metals Ltd. (Teck).

The annual inspection site visit was completed on 22 September 2020 by the Engineer of Record, Ben Wickland, P.Eng., and by Martyn Willan, P.Eng., both from Golder. The site visit was accompanied by Morgan Lypka from Teck and Clell Crook Jr. of Maskwa Engineering Ltd. (Maskwa).

This report is to be read with the Study Limitations section, provided at the end of the report, which forms an integral part of this document.

Summary of Facility Description

The site is located approximately 75 km east of the town of Hay River and approximately 6.5 km south of Great Slave Lake in the Northwest Territories. The Pine Point TIA was closed after ceasing operations in 1988 and in active care and maintenance during the monitoring period. The TIA is formed by the north, east, west, and south dykes and covers an area of approximately 2.5 by 2.8 km in plan, or approximately 700 ha.

Between 50 and 60 million tonnes of lead-zinc tailings are stored in the Pine Point TIA.

Summary of Key Hazards

Golder understands that Teck's long-term goal for all Teck tailings facilities is to reach landform status with all potential failure modes being reduced to non-credible. The Pine Point TIA still has dykes which retain water and tailings, and potential credible failure modes therefore exist.

Key potential hazards identified for the Pine Point TIA dykes and the observed status in 2020 include:

Overtopping

- The water level in the pond was within the operating levels and the facility met freeboard criteria for the monitoring period.
  - On 10 May 2020 the pond level was 201.68 m, just above the 201.6 m alert level.
  - Daily monitoring of climate and pond level was completed from 11 May to 19 June 2020, at which point the water level had dropped to below the alert level.
  - The maximum pond level measured in the monitoring period was 201.68 m on 14 May 2020, and was below the maximum operating water level of 201.8 m.
- In September 2020 additional instrumentation was installed to allow remote monitoring of the pond water level. A vibrating wire piezometer was installed in the deeper portion of the pond and a webcam was installed to allow remote viewing of pond staff gauge. The instrumentation will supplement an existing vibrating wire piezometer installed in the pond.
- Erosion resulting in the loss of the north dyke crest adjacent to the pond could, if left for several years, lead to overtopping failure. Maintenance was completed in September 2020 to repair rills that extended into or near the dyke crests.

Internal Erosion (Piping)

- No conditions were observed during the 2020 annual inspection that would indicate piping, such as increases in seepage rates, change in seepage quality indicating movement of material, or sinkholes. This is consistent with past observations of the facility by Golder.

Instability

- No conditions were observed during the 2020 annual inspection that would indicate instability, such as cracks, settling, or bulging of the dykes.

Consequence of Hypothetical Failure

The CDA (2013) guidelines provide a system to classify dams based on the consequences of a hypothetical failure or potential damage that could be caused if a dam fails. While not developed for tailings facilities, the CDA consequence classification system has been applied to many tailings facilities with retention embankments (dams). Consequence classification is not related to the likelihood of a failure, but rather the potential impact if a hypothetical failure did occur. The south and east dykes were classified as “Low” consequence structures, while the west and north dykes were classified as “Significant” consequence structures based on CDA (2013).

The TIA is in the closure – active care phase of mine life based on CDA (2014).

There were no changes in the dams, water management, guidelines, regulations, or potential downstream receptors related to dam consequence classification in the monitoring period. As such, the consequence classifications remain unchanged from the 2019 annual inspection (Golder 2019).

Summary of Key Observations

Facility conditions and maintenance requirements were evaluated primarily through site observations and considered:

- Observations made by Golder during the 22 September 2020 annual inspection site visit.
- Observations made by Maskwa during routine inspections on 2 October 2019 and 18 May 2020.
- Review of available data from site instrumentation/monitoring devices.
- Review of climate data from the monitoring period.

A review of site climate indicated that total precipitation from 1 September 2019 to 31 August 2020 was approximately 15% higher than the long-term average. July and August 2020 were particularly wet months, with rainfall more than twice the long-term average.

The north, south, east, and west dykes of the TIA were generally in good condition at the time of the 2020 annual inspection. Higher than average rainfall in 2020 resulted in increased erosion and rilling, compared to recent years, maintenance repairs were completed in September 2020.

Water was treated and discharged from the TIA during the annual water treatment program with a total volume of 383,451 m^3 of treated water released between 1 July 2020 and 16 September 2020. The 2020 treated discharge volume was 46% more than the historical average of approximately 262,250 m^3. The higher volume of treated discharge is associated with the higher than average rates of precipitation in 2020.

Instrumentation/monitoring devices included:

- 19 vibrating wire piezometers, connected to a remote monitoring system
  - 4 vibrating piezometers were installed as part of site investigations in September 2020, including one in the main pond. Reporting and interpretation of baseline data from these instruments was in progress at the time of this report.
- 18 standpipe groundwater monitoring wells
  - monitoring data were not available at the time of this report
- a site climate station
- a remote view camera which monitors the pond level staff gauge was installed in September 2020

Available piezometer data from 7 November 2018 to 30 September 2020 was reviewed for general trends. Data were not indicative of conditions which may impact dam safety. Interpretation and establishment of instrument baselines and quantifiable performance objectives was in progress at the time of this report. Instruments PP-VWP-2018-01B, VWP-2018-02A, VWP-2018-02B, VWP-2018-08 and VWP-2018-09 reported data that was interpreted to be erroneous, with troubleshooting planned.

Summary of Significant Changes

None of the monitoring data reviewed indicated a concern with the integrity of the dykes. No significant changes to site conditions were observed that could reasonably be expected to compromise the stability of the dykes or surface water control systems. Conditions remained materially unchanged from the 2019 annual inspection.

New instrumentation was installed at the TIA during the monitoring period including a remote view camera that allows remote monitoring of the pond staff gauge, 6 additional groundwater monitoring wells to support closure studies and 4 additional vibrating wire piezometers.

The Type A land use permit was amended 17 September 2020 to include an updated surface lease boundary (L-2000009T).

Summary of Review of Operation, Maintenance, and Surveillance Manual and Mine Emergency Response Plan

Version 5 of the OMS manual was issued in May 2020 (Teck 2020b).

Updates included the addition of a requirement to update emergency response documentation and transition of emergency response procedures from an emergency response and preparedness plan (EPRP) to a mine emergency response plan (MERP; Teck 2020a).

Dam Safety Review

A dam safety review of the north, south, and west dykes was conducted by SRK Consulting Inc. in 2014 (SRK 2016). CDA (2013) guidelines recommend that a dam safety review be conducted once every 10 years for embankments with a Significant dam classification, such as the west and north TIA dykes. Based on CDA guidance, the next dam safety review for the west and north TIA dykes is to be undertaken no later than the end of 2024.

Summary Table of Deficiencies and Non-conformances

Deficiencies/non-conformances and recommended actions are presented in Table E-1.

Table E-1: Deficiencies/non-conformances and Recommended Actions

Structure	ID Number	Deficiency or Non-conformance	Applicable Regulation or Manual Reference	Recommended Action	Priority	Recommended Deadline/Status as of 08 December 2020
Polishing pond	2018-2	No written procedure for sludge removal	none	Update Water Treatment Manual to include written maintenance procedure for removal of sludge from polishing pond including dewatering operations.	4	Closed – Incorporated in V003 of the Water Treatment Manual (30 April 2020).
TIA	2018-3	Inaccurate storage curve for facility	4.3.3 of OMS Manual	Complete bathymetry and tailings topographic survey to define the facility storage curve. Review flood storage capacity and water handling practices, determine capacity of spillway and update freeboard limits. Incorporate these changes in the OMS manual. Consider preparing for high water levels in spring 2019 and requirement to treat water at freshet.	2	Closed 2020 Survey was completed Q1 2019 and the 2019 freshet has passed. Remaining actions are moved to 2020-03.
North dyke	2019-1	Vibrating wire piezometers – faulty readings. PP-VWP-2018-01B PP-VWP-2018-02A PP-VWP-2018-02B PP-VWP-2018-08 PP-VWP-2018-09	none	Troubleshoot vibrating wire piezometer calibration / data acquisition and data reduction. Faulty or damaged instruments should be repaired or replaced.	4	Deadline updated to by end of Q4, 2021. Faulty instruments that are identified to be required for trigger-action-response-plans (planned) should be replaced.
TIA Instrumentation	2019-2	Instrumentation installed in 2018 requires integration into OMS procedures	4.2 and 4.3 of OMS manual	Establish procedures for frequency of data acquisition and review. Establish baseline readings and levels for alert and emergency response, with corresponding update of OMS manual.	4	Deadline updated to by end of Q4, 2021 / in progress
TIA	2019-3	EPRP is out of date and does not reflect recent staff changes	CDA 2013	Update EPRP for changes to site manager and Engineer of Record. ■ Update OMS manual to include change management procedure to update EPRP.	4	Closed – Incorporated in V005 of the OMS manual (1 May 2020) and V0.2 of the MERP (31 March 2020).
TIA	2020-01	Erosion rills require maintenance.	5.5 and 5.6 of OMS	The following erosion rills require maintenance: ■ south dyke - 3 rills on upstream slope at east end ■ north dyke – 1 rill on the downstream slope approximately 25 m east of the north west corner ■ north dyke – 1 rill on the upstream slope east of the polishing pond	4	Closed Maintenance completed September 2020.
TIA	2020-02	Pond water at 200.92 m, which is higher than historic levels following water treatment, with reduced storage capacity for the 2021 freshet.	1.0 Water Treatment Manual	Prepare an interim plan to manage 2021 freshet.	3	Q2 2021 (freshet).
TIA	2020-03	Freeboard limits require update for 2019 storage curve, 2020 climate assessment, review of design criteria, and evaluation of spillway capacity.	OMS Manual 2.7.3.2.3	a) Define interim freeboard limits (support 2020-02). b) Review flood storage capacity, water handling practices, determine capacity of spillway and update freeboard limits. Incorporate these changes in the OMS manual.	3	a) Q1 2021 b) Q4 2021

Priority[a]	Description
1	High probability or dam safety issue considered immediately dangerous to life, health or the environment, or a significant risk of regulatory enforcement.
2	If not corrected/implemented could likely result in dam safety issues leading to injury, environmental impact or significant regulatory enforcement; or, a repetitive deficiency that demonstrates a systematic breakdown of procedures.
3	Single occurrences of deficiencies or non-conformances that alone would not be expected to result in dam safety issues.
4	Best Management Practice – Further improvements are necessary to meet industry best practices or reduce potential risks.

a) Source: Teck 2019.

ID = identification; OMS = operation, maintenance, and surveillance; TIA = tailings impoundment area; CDA = Canadian Dam Association; EPRP = Emergency Preparedness and Response Plan; MERP = Mine Emergency Response Plan.

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1.0 INTRODUCTION

As requested by Teck Metals Ltd. (Teck), Golder Associates Ltd. (Golder) prepared this 2020 annual inspection report for the north, south, east, and west dykes of the tailings impoundment area (TIA) at the Pine Point Mine, Northwest Territories. This report is to be read with the Study Limitations section, provided at the end of the report, which forms an integral part of this document.

1.1 Purpose, Scope, and Method

The annual inspection report was prepared in accordance with Canadian Dam Association (CDA 2013) guidelines, as well as the Teck *Guideline for Tailings and Water Retaining Structures* (Teck 2019a), and is intended to meet the requirement of the Pine Point Water Licence (MV2017L2-0007) for the production of an annual geotechnical inspection report.

This report includes:

- a summary of regulatory requirements, facility description, and background information
- a summary of the construction, operating, and/or repair activities (if any) for the monitoring period
- review of
  - climate data and water balance
  - facility freeboards
  - monitoring data including site instrumentation
  - required operational documents
- dam consequence classification
- assessment of dam safety relative to potential credible failure modes
- findings and recommended actions
- site photographs and records of dam inspection

This report is based primarily on observations made by Golder during the 22 September 2020 annual inspection site visit, routine inspections carried out by Maskwa Engineering Ltd. (Maskwa) on 2 October 2019 and 18 May 2020, and available monitoring/instrumentation data.

The 2019/2020 monitoring period is defined as 1 September 2019 to 30 September 2020. The monitoring period was extended by 1 month to 13 months to cover the annual site visit completed 22 September 2020. Climate data was reviewed for the period of 1 September 2019 to 31 August 2020.

The previous annual inspection was carried out on 12 August 2019 (Golder 2019).

1.2 Regulatory Requirements

Applicable legislation, permits, and guidelines governing the Pine Point TIA are listed here.

1.2.1 Acts

- *Mackenzie Valley Resources Management Act*, S.C. 1998, c.25, last amended 12 December 2017
- *Mackenzie Valley Waters Act*, S.N.W.T, 2015, c.1, in force 1 September 2016
- *Northwest Territories Mine Health and Safety Act,* S.N.W.T, c.25, in force 15 December 1995
- *Northwest Territories Mine Health and Safety Regulations,* R-125-95 and amendments, 21 September 2018

1.2.2 Permits and Licences

- Water Licence MV2017L2-0007, valid to 24 October 2027
- Type A Land Use Permit MV2019X0006, valid to 15 May 2024
  - Amendment granted 17 September 2020 to incorporate lease boundary L-2000009T

The Pine Point TIA is closed and does not have a permit to operate.

1.2.3 Guidelines

- Canadian Dam Association (CDA)
  - *Dam Safety Guidelines* (CDA 2013)
  - *Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams* (CDA 2019)
- Mining Association of Canada (MAC) *A Guide to the Management of Tailings Facilities* (MAC 2019)
- *Guideline for Tailings and Water Retaining Structures* (Teck 2019a)
- *Global Industry Standard on Tailings Management (GTR 2020)*

Golder understands that Teck's long-term goal for all Teck tailings facilities is to reach landform status with all potential failure modes being reduced to non-credible.

1.3 Facility Description

The site is located approximately 75 km east of the town of Hay River and 6.5 km south of Great Slave Lake in the Northwest Territories (Figure 1). The Pine Point TIA is closed and in a state of active care and maintenance. A plan showing the layout of the TIA is presented in Figure 2. The TIA is located to the north of the former Pine Point mill site on terrain that slopes gently towards the northwest. The TIA covers an area approximately 2.5 by 2.8 km in plan, or roughly 700 ha, and includes north, south, east, and west dykes that retain between 50 and 60 million tonnes of lead-zinc tailings from historical mining operations, as well as a permanent water pond on the north side. The TIA includes a spillway from the main pond and a separate spillway from the polishing pond at the north side. The polishing pond spillway is typically used to release water after treatment. The tailings were covered with granular material, average thickness 0.15 m, to control dust.

The Teck Type A land use permit was amended 17 September 2020 to include an updated surface lease boundary (L-2000009T). With the amendment, the surface lease covers an area of approximately 940 ha.

The total length of dykes is approximately 8.5 km, and the maximum height of dykes approximately 9 m. The dykes were constructed of earthfill and extend fully along the north and west sides and along portions of the south and east sides. Describing the system clockwise from the south, the south dyke varies in height from flush with existing terrain at the southeast corner of the TIA to 4 m high at the southwest corner. The west dyke connects to the south dyke and has a maximum height of approximately 9 m. The north dyke connects the west and east dykes and varies from 9 m in height at the connection with the west dyke to 1.5 m in height at the east dyke. The east dyke is between 1 and 2 m in height and continues along the east side until the natural ground surface rises above the dyke crest elevation. The east dyke is approximately 200 m long. Cross-sections of the dykes are presented in Figure 5 and Figure 6 based on 2018/2019 survey data and section locations are shown in Figure 4. Historical cross-sections of the dykes (Golder 1981) are presented in Appendix A.

Water is typically released from the TIA each year following treatment to meet Water Licence discharge criteria and to reduce pond levels prior to the winter. Water is released from the main pond to the polishing pond through a culvert that passes through the internal polishing pond dyke. Water passing through the culvert is injected with a lime solution, allowed to mix and sediment while passing through a serpentine polishing pond, then discharged via siphons through the polishing pond spillway. Water treatment occurs in the summer months and typically runs for four to six weeks.

The Engineer of Record (EOR) for the Pine Point TIA is Dr. Ben Wickland, P.Eng., an employee of Golder.

The Site Manager for the Pine Point TIA is Ms. Michelle Unger, an employee of Teck.

The Tailings Surveillance Officer is Mr. Clell Crook, an employee of Maskwa, who completes routine inspections and event-driven/special inspections.

A facility data sheet for the Pine Point TIA is provided in Appendix B.

1.4 Background Information and History

Mine construction at Pine Point started in 1962, and mining began in 1964. High grade ore was shipped by rail starting in 1965. The mine operated at 5,000 tonnes per day initially, with expansion to 10,000 tonnes per day in 1973. The mine ceased operations in 1988 and the mill buildings and tailings conveyor (trestle) were dismantled and removed.

The TIA is located on the Taiga Plains (Great Slave Lake plain). Based on field observations during the 2018 site investigation the general, natural stratigraphy in the area of the Pine Point TIA consists of, from top to bottom:

- peat/organic soils – average of 0.3 m thick
- lacustrine deposits – average of 6.2 m thick
- till – average 5.4 m thick
- bedrock

Further investigations were completed in 2020; factual reporting was in progress at the time of this report.

The site is within the discontinuous, sporadic permafrost zone; however, no frozen soil was encountered during the 2018 or 2020 investigations, with measured ground temperatures above freezing.

The TIA dykes are founded on glacial deposits and on east–west trending beaches indicative of sand ridges formed by Great Slave Lake during an earlier period. The west dyke is the highest dyke at approximately 9 m. The dykes consist of a silt or clay upstream zone, which acts as a low hydraulic conductivity element, and a downstream zone developed with sand and gravel from local borrow sources. The downstream slopes are 2 horizontal to 1 vertical.

The dykes were raised and extended in several stages during the life of the mine by the downstream method of construction. The last three crest level increases to the dykes were:

- **1976**—The crest of the north dyke was raised by 2.1 m to elevation 203.5 m and extended to the northeast corner of the pond. Construction of a segment of the east dyke was also carried out.
- **1981**—The west and south dykes were raised and the south dyke was extended eastwards.
- **1987**—The dykes were raised by 1 m or less to elevation 205.7 m in July and August 1987. Fill was added to the south and west dykes and to a portion of the north dyke at this time.

A complete construction record report is not available for the facility. Similarly, a design report is not available.

A stability review of the west dyke was carried out as part of the 1987 raise (Golder 1987) and indicated that the dyke achieved a factor of safety for static loading of 1.5 with the inclusion of a 1.5 m high toe berm. This toe berm was developed in 1987, when the dyke crest was last raised. Additional stability analyses have been completed as part of a dam safety review (SRK 2016).

The only remaining mining installation at the site is the closed TIA.

The tailings were covered with an average 0.15 m of gravel to control dust.

2.0 CONSTRUCTION AND OPERATION

The Pine Point Mine has not been in operation since 1988.

For the 2019/2020 monitoring period, there were no operations, no new tailings or wastes were deposited into the facility, and there was no construction.

Activities at the TIA included the following:

- Maintenance repairs of 5 rills and of ruts on the crests of the dykes identified during the 22 September 2020 annual inspection were completed on 22 and 29 September 2020.
- Installation of 4 vibrating wire piezometers as part of site investigations in September 2020.
- Installation of a remote view camera to monitor the main pond staff gauge, installed in September 2020.
- Vegetation clearance on south dyke, at west end in September/October 2019.
- The annual water treatment campaign was carried out, as described in Sections 3.4 and 3.5.
- The following activities were also completed in relation to closure and reclamation planning:
  - installation of 6 groundwater monitoring wells including slug testing in September/October 2019
  - groundwater and surface water monitoring in September 2019 and July and October 2020
  - climate station maintenance
  - installation of a field wetland treatment pilot system along eastern extent of TIA
  - three snow depth monitoring events in winter 2019/2020
  - mapping of eastern drainage area and preliminary wildlife habitat assessment in July 2020
  - vegetation survey completed in July 2020
  - installed two water quality monitoring probes in main pond in July 2020

3.0 CLIMATE DATA AND WATER BALANCE

3.1 Review and Summary of Climate Data

The climate characteristics at the Pine Point TIA were reviewed with respect to precipitation, the main driver for the water balance at the site. Air temperatures were also reviewed to provide support for the assessment of precipitation. Long-term climate characteristics based on climate data from 1953 to 2019 were established for a hydrological year (September to August) at the Pine Point TIA and compared to recent climate observations from September 2019 to August 2020. The recent climate at Pine Point was estimated based on observations from Environment and Climate Change Canada Hay River stations (Station IDs: 2202401 and 2202402; ECCC 2019). Missing data from Station 2202401 were infilled with data from Station 2202402. Data from these stations were adjusted to account for regional and under-catch factors as well as sublimation, following the methods in Teck (2017a).

Analyses were in progress at the time of this report to update correction factors for Hay River data for estimating Pine Point site climate parameters. The analyses will be reported separately and will be incorporated into future annual inspection reporting. A review of data provided by Barr Engineering Ltd. (Barr) for the site climate station is provided in Section 3.1.1.

The estimated annual rainfall, snowfall, total precipitation, and air temperature at the Pine Point TIA is presented in Table 1.

Table 1: Average Climate Characteristics at the Pine Point Mine (adjusted from Hay River stations)

Climate	Average Air Temperature (°C)	Annual Precipitation (mm)		
		Rainfall	Snowfall[(a)]	Total Precipitation
Long-term annual average (September 1953 to August 2019)	-2.8	231	229	460
Monitoring period (September 2019 to August 2020)	-3.4	357	174	531

(a) Adjusted to account for snowpack losses of 31%.

Monthly rainfall, snowfall, and total precipitation (i.e., long-term and for the monitoring period) are presented in Illustration 1 and indicate:

- Total precipitation in the period 1 September 2019 to 31 August 2020 was approximately 15% higher than the long-term average.
- July and August 2020 were particularly wet months, with rainfall more than twice the long-term average. The site climate station did not record any events where total rainfall exceeded 50 mm in a five day period (equivalent to a 10-year daily rainfall event) that would trigger an inspection based on the requirements listed in the OMS manual.
- Recorded snowfall was lower than the long-term averages during the winter months, with the exception of September and October 2019 and January and April 2020.
- Recorded rainfall was lower than the long-term averages from October 2019 to May 2020 and higher than the long-term averages for all other months.

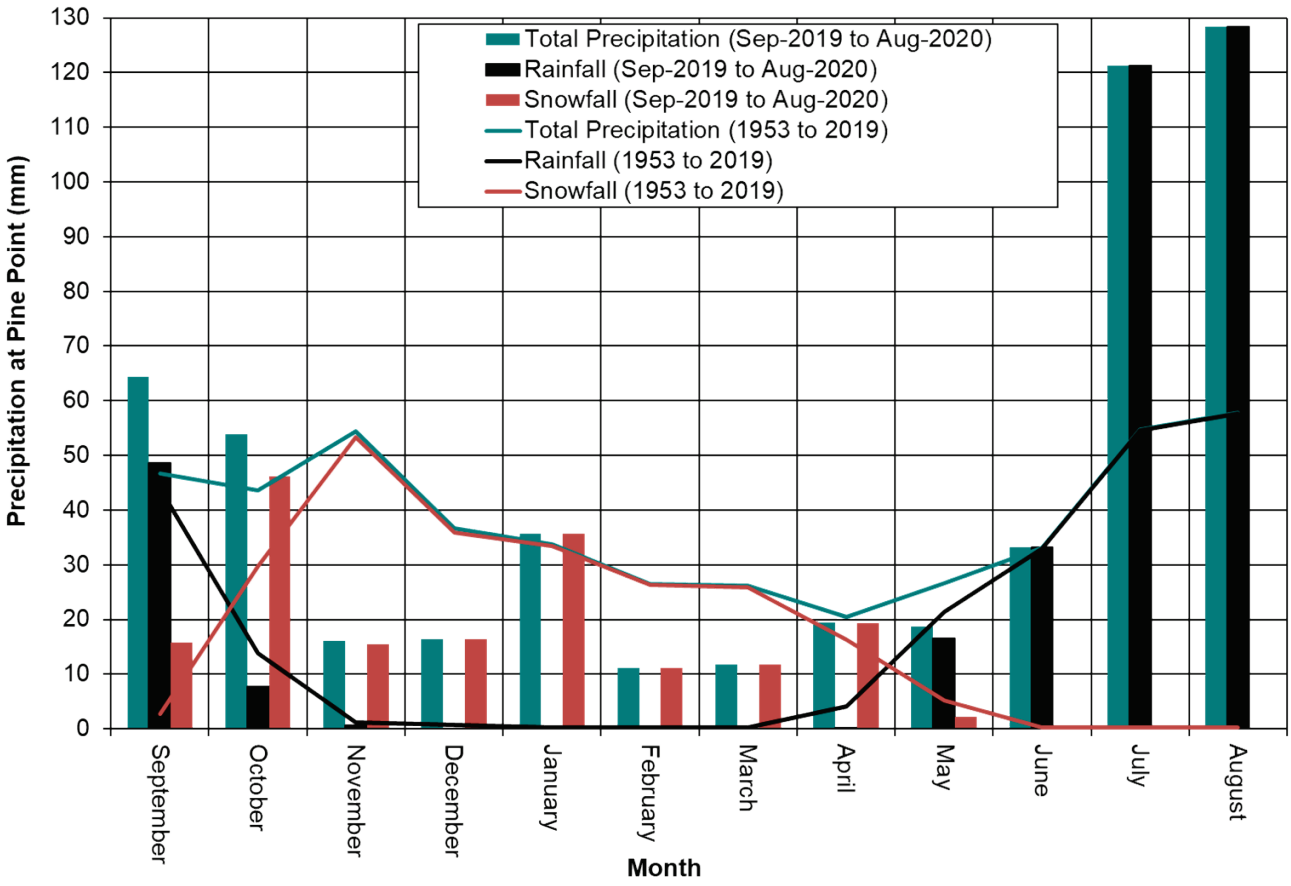


Illustration 1: Monthly Precipitation at the Pine Point Mine (adjusted from Hay River stations)

Air temperatures during the monitoring period were similar to long-term averages throughout the year. Recent and long-term average monthly air temperatures are presented in Illustration 2.

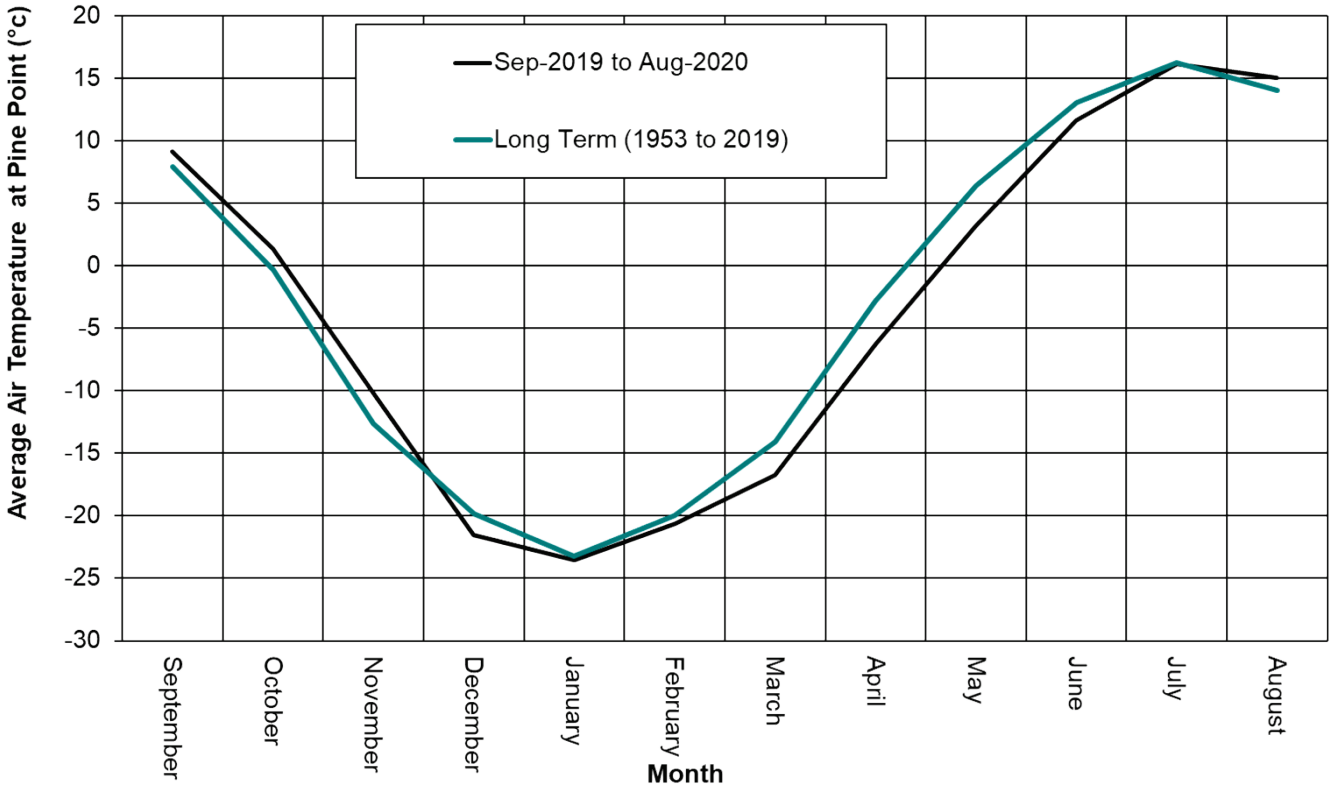


Illustration 2: Monthly Temperature at the Pine Point Mine (adjusted from Hay River stations)

3.1.1 Site Climate Station Data

The site climate station was installed in 2018 and records:

- air temperature
- relative humidity
- wind speed and direction
- solar radiation
- precipitation

Snow depth and snow water equivalent are manually measured on the TIA surface periodically throughout the winter months.

Temperature, relative humidity, wind speed, and solar radiation were recorded at the climate station starting in October 2018. At this time, the climate station is unable to record precipitation as snowfall and can only record rainfall. Due to the limited record length and the uncertainty in snowfall recorded at the site climate station, these data are not incorporated into the water balance presented in Section 3.2.

Two snow depth and snow water equivalent measurements were taken during the monitoring period:

- 19 February 2020 – 42.0 cm depth = 96.6 mm water equivalent (33% higher than February 2019)
- 25 March 2020 – 50.0 cm depth = 120.0 mm water equivalent (90% higher than March 2019)

The measured 2020 snowpack on site was larger than the measured 2019 snowpack, which contributed to higher water levels in the TIA pond during the 2020 freshet and triggered water level monitoring activities in May 2020 as described in Section 3.3. Snowpack and snow water equivalent measurements will continue to be taken throughout the winter months at the TIA to help anticipate freshet snowmelt volumes and plan preparatory action.

3.2 Water Balance

The TIA has a catchment area of approximately 9 km^2. Precipitation from rainfall and snow is assumed to be the only source of water reporting to the pond (no groundwater inflows are considered). Teck (2017b) indicates that the pond water level is lowered by approximately 0.7 m, on average, varying from 0.34 to 1.3 m, during annual water treatment. The recorded pond levels presented in Appendix C indicate a maximum variation of 2.3 m.

The water balance (Teck 2020b) was updated with climate data for the period of September 2019 to August 2020 using the Hay River converted data as shown in Section 3.1. The updated water balance is shown in Table 2. The water balance for the TIA uses total precipitation and subtracts measured discharge (from annual water treatment or other authorized discharge) to estimate total losses. Total losses include evapotranspiration and seepage losses.

Table 2: Tailings Impoundment Area Water Balance

Year[a]	Discharged Volume[b] (m^3)	Discharge[c] (mm)	Rainfall (mm)	Snowfall[d] (mm)	Total Precipitation[e] (mm)	Total Losses[e] (mm)
Average from 1993–2019	255,286	28	246	239	485	457
2019/2020	383,451	43	357	174	531	488

(a) From September to August the following year.
(b) From water treatment or other authorized discharges.
(c) Discharged volume represented as equivalent depth.
(d) Adjusted to account for snowpack losses of 31%.
(e) Normalized to the approximate catchment area of 9 km^2.

3.3 Freeboard and Storage

The pond level met criteria for freeboard during the monitoring period.

The maximum pond level observed at the polishing pond staff gauge in the monitoring period was 201.68 m, recorded on 14 May 2020 (Section 4.2.2). The maximum pond level was below the maximum operating water level of 201.8 m and above the alert water level of 201.6 m. As triggered by the alert level, daily climate tracking and climate forecasts were monitored as indicators of potential changes in pond level until the pond level dropped below the alert level of 201.6 m. Daily monitoring of climate and pond level was completed from 11 May to 19 June 2020, at which point the water level had dropped to 201.57 m. The water level continued to drop until the start of annual water treatment discharge on 1 July 2020, when the water level was 201.48 m.

The corresponding minimum observed freeboard was:

- 1.82 m to the north dyke crest
- 0.82 m to the main pond spillway

The main pond was at elevation of 201.00 m on 31 August 2020 (end of hydrology year) and at elevation 200.87 m on 16 September 2020, at the end of the annual water treatment program.

Individual pond staff gauge readings are presented in Appendix C.

The storage curve for the TIA main pond is presented in Illustration 3, and in Table 3, developed from topographic and bathymetric surveys from 2018/2019.

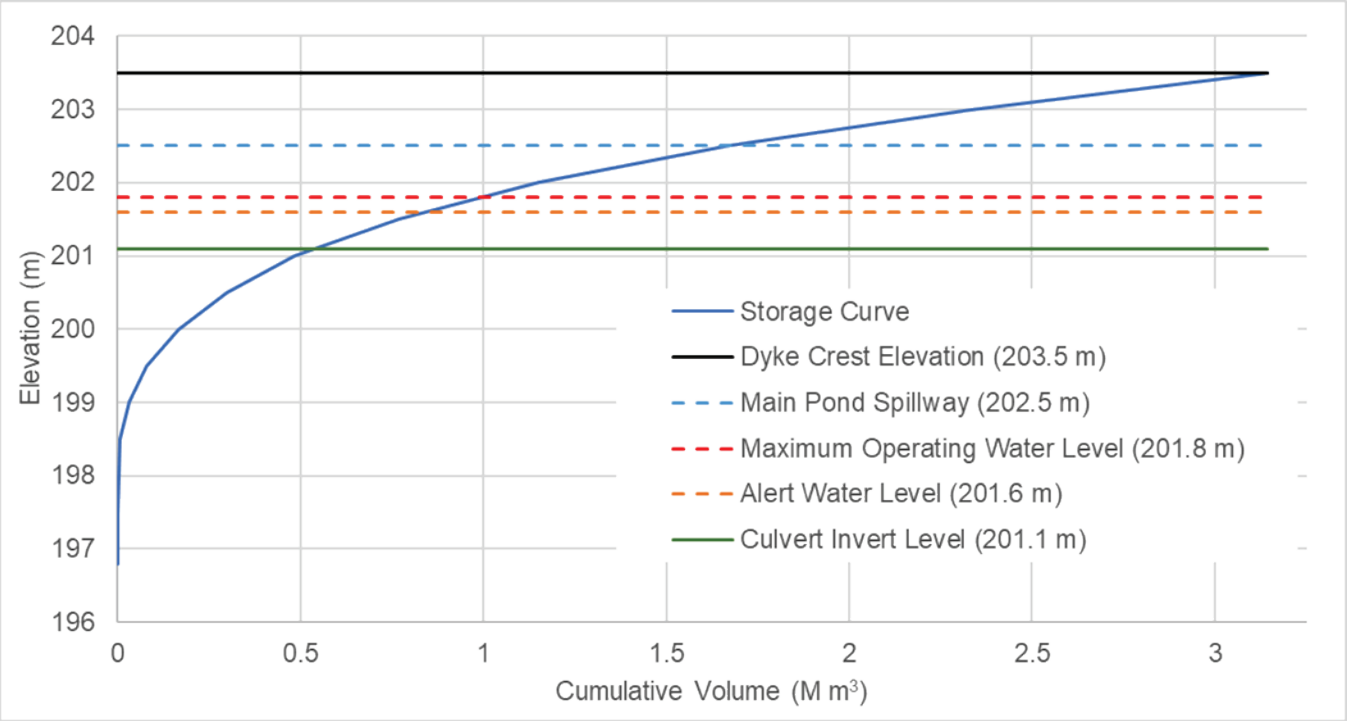


Illustration 3: Tailings Impoundment Area Main Pond Storage Capacity Curve (2018/2019 Survey)

Table 3: Tailings Impoundment Area Main Pond Storage Capacity Curve (2018/2019 Survey)

Pond Elevation (m)	Storage Volume (m^3)
197	16
198	2,892
199	31,316
200	165,290
201	484,336
202	1,150,788
203	2,331,293
203.5	3,143,530

The alert and maximum operating pond water levels and freeboard for the TIA in the OMS Manual (Teck 2020b) are presented in Table 4 and were updated in 2017 with quantifiable performance objectives based on historic performance. An update of quantitative performance objectives (QPOs) for freeboard is planned for 2021.

Table 4: Quantitative Performance Objectives – Tailings Impoundment Area Pond Level (update planned)

Objective[a,b]	Pond Level (m)	Freeboard (m)	Actions if Observed
Alert water level	201.6	1.9	The site manager should be informed immediately, and water treatment should start as early as practicable. A site inspection should take place within one week of the initial alert level observation.
Maximum operating water level	201.8	1.7	The site manager should be informed immediately and actions to reduce the water level within the pond should commence as a matter of urgency.

(a) Alert level established based on historical records and equivalent to the highest water level record for the site up to February 2017.

(b) Teck 2020b.

3.4 Water Discharge Volumes

Water was treated and discharged from the TIA during the annual water treatment program with Teck reporting that a total volume of 383,451 m^3 of treated water was released between 1 July 2020 and 16 September 2020. The 2020 treated discharge volume was 46% more than the historical average of approximately 262,250 m^3. As indicated in Table 1, total precipitation (rainfall and snowfall) for the period 1 September 2019 to 31 August 2020 was higher than the long-term average. Higher water levels in the TIA following freshet and higher than average rainfall over the summer months resulted in higher treated discharge volume.

The pond water level was 201.48 m at the start of water treatment and 200.87 m at the completion of the annual water treatment program.

3.5 Water Discharge Quality

Water quality results are submitted to the Mackenzie Valley Land and Water Board as part of the Annual Water Licence Report in March the year following the operational period covered (i.e., in March 2021 for the 2020 operational period, in accordance with Water Licence No. MV2017L2-0007).

4.0 SITE OBSERVATIONS

Scheduled site inspections by the EOR and the Tailings Surveillance Officer included:

- EOR
  - 22 September 2020 – annual inspection site visit
- Tailings Surveillance Officer
  - 2 October 2019 – routine fall inspection
  - 18 May 2020 – routine spring inspection

The annual inspection site visit was carried out 22 September 2020 by:

- Golder
  - Dr. Ben Wickland, P.Eng. (EOR)
  - Mr. Martyn Willan, P.Eng.

The inspection was accompanied by:

- Teck
  - Ms. Morgan Lypka
- Maskwa
  - Mr. Clell Crook Jr.

The temperature during the visit was approximately 15°C and the weather was sunny, partly cloudy with a light wind. The September inspection report is presented in Appendix D and includes site photographs and observations.

4.1 Observations

General observations from the 2020 annual inspection include:

- The north, south, east, and west dykes of the TIA were generally in good condition at the time of the 2020 annual inspection. Higher than average rainfall in 2020 resulted in more erosion and rilling than observed in recent years, with maintenance repairs completed in September 2020.
  - The south dyke had rills up 30 cm deep on the upstream slope and rills up to 20 cm deep on the downstream slope.
    - Three rills on the upstream slope were repaired on 29 September 2020, which were 30 cm deep and 1.3 m wide and extended into the dyke crest by up to 1.3 m.

- The west dyke had rills up to 30 cm deep on the upstream and downstream slopes.
  - In the central portion of the west dyke the downstream slope had extensive rilling with local accumulation of fines at the toe of the slope over a length approximately 350 m. Two rills had sharper unweathered edges and were 0.4 to 0.5 m deep and 1.7 m wide. The rills were confined to the lower downstream slope, which steps out, and did extend into the dam crest.
  - At several locations rills joined lower on the slope.
- The north dyke had rills up to 30 cm deep on the upstream and downstream slopes.
  - One rill was repaired on the downstream slope of the north dyke on 29 September 2020, near the west dyke. The rill was first observed during the spring routine inspection and was approximately 80 cm deep and 1 m wide.
  - One rill was repaired on the upstream slope of the north dyke on 29 September 2020, just east of the polishing pond. The rill had cut back into the dam crest.
- The east dyke had rills up to 15 cm deep on the upstream and downstream slopes.

- The dam crest had local rutting due to vehicle traffic
  - Ruts on the crest of the south dyke between the two access ramps were repaired on 22 September 2020
  - An approximately 25 m long rut in the crest of the north dyke was also filled on 29 September 2020, near the west end of the dyke.
- Maintenance repairs of the north dyke in 2018 to address erosion of the upstream slope west of the dogleg appeared to be in good condition and generally stable with some exposed geotextile.
  - A previously observed step in the slope was submerged and not visible during the inspection. The repair should continue to be monitored.
- At the east end of the 2018 maintenance repairs, a 30 cm high scarp with exposed core remained in the upstream slope of the north dyke adjacent to the pond. The area has undersized riprap and should continue to be monitored.
- Vegetation had been cut and left in place on the downstream slope of the west end on the south dyke. Vegetation on the upstream slope of the east end of the south dyke was similar to previous years.
- Minor vegetation was observed on upstream and downstream slopes of the west end of the north dyke. Vegetation including sapling trees and rosehip bushes was observed on the upstream and downstream slopes, and near the crest of the central and east end. No action was recommended in 2020, but vegetation should continue to be monitored and managed following the procedures in the OMS manual.
- Polishing pond dyke slopes were in good condition, with minor rilling and no evidence of seepage.
- Sludge and soil from water treatment was stacked at a higher elevation than the north dyke crest. No action is recommended but continuing to stack soil and sludge to greater height may create a potential for instability. Teck reported tamping the materials down at end of water treatment in 2020.

Main pond water levels during routine and annual inspections were:

- 2 October 2019 – 200.39 m
- 18 May 2020 – 201.66 m
- 22 September 2020 - 200.92 m

4.2 Instrumentation Review

Geotechnical instrumentation in the TIA included a staff gauge located at the polishing pond dyke which measured the main pond level, flow meters on siphons from the polishing pond, vibrating wire piezometers (VWP) and groundwater monitoring wells. It is understood that data for groundwater monitoring wells, installed to inform closure planning, will be reported in the TIA reclamation research report (prepared by others). Instrumentation locations are presented in Figure 3.

A remote view camera was also installed in September 2020, to view the staff gauge installed at the inlet of the culvert between the main pond and polishing pond.

4.2.1 Vibrating Wire Piezometers

Nineteen VWPs were monitored and /or installed during the monitoring period, listed in Table 5. Reporting and interpretation of baseline data for new instruments was in progress at the time of this report.

Table 5: Summary of Vibrating Wire Piezometer Installations

Borehole ID	Teck Instrumentation ID	Sensor Depth (m bgs)	Tip Elevation[(a)] (m)	Monitored Unit	Functioning Correctly
BH18-B-01	PP-VWP-2018-01A	10.8	199.39	Soil	Yes
	PP-VWP-2018-01B	9.5	200.69	Tailings	No
BH18-B-02	PP-VWP-2018-02A	9.5	203.04	Soil	No
	PP-VWP-2018-02B	8.0	204.54	Tailings	No
BH18-B-03	PP-VWP-2018-03A	12.2	192.86	Soil	Yes
	PP-VWP-2018-03B	7.8	197.26	Soil	Yes
	PP-VWP-2018-03C	6.3	198.76	Tailings	Yes
BH18-B-04	PP-VWP-2018-04A	5.4	199.43	Soil	Yes
	PP-VWP-2018-04B	4.4	200.43	Tailings	Yes
BH18-B-05	PP-VWP-2018-05	5.7	191.55	Soil	No
BH18-B-06	PP-VWP-2018-06	4.5	196.44	Soil	Yes
BH18-G-26	PP-VWP-2018-07	9.1	195.22	Dyke fill	Yes
BH18-G-27	PP-VWP-2018-08	3.6	200.46	Dyke fill	No
BH18-G-31	PP-VWP-2018-09	5.0	198.35	Dyke fill	No
Main Pond Level	PP-VWP-2018-10	Main Pond	N/A	Main pond water level at polishing pond dyke	Yes

Table 5: Summary of Vibrating Wire Piezometer Installations

Borehole ID	Teck Instrumentation ID	Sensor Depth (m bgs)	Tip Elevation[a] (m)	Monitored Unit	Functioning Correctly
BH20-G-30	PP-VWP-2020-11A	4.6	198.9	Dyke Fill	N/A[b]
	PP-VWP-2020-11B	9.1	194.3	Soil	N/A[b]
	PP-VWP-2020-11C	21.3	182.2	Soil	N/A[b]
Main Pond Level	PP-VWP-2020-12	3.5 m (below pond level)	To be Determined[b]	Main pond water level at north dyke, west of dogleg	N/A[b]

(a) Vertical datum: NAVD83.

(b) Reporting and interpretation of baseline data in progress at the time of this report.

m bgs = meters below ground surface; N/A = not available.

VWPs installed in 2018 were connected to a remote monitoring system in November 2018, except for PP-VWP-2018-05 which was connected in June 2019. VWPs installed in 2020 were connected to the system in October 2020, data set-up and validation was in progress at the time of this report. The remote monitoring system allows instrumentation data to be viewed remotely by the Teck and EOR team.

Available VWP data are presented in Appendix E, including a review of recorded data. Data in the 2019/2020 monitoring period are compared to data in the 2018/2019 monitoring period to review overall trends and discussed in in Section 5.0.

Data in Appendix E are not corrected for barometric pressure, with the exception PP-VWP-2018-10, which monitors the pond water level.

Negative pressure readings indicate the vibrating wire piezometer tip is dry. Piezometric levels cannot be determined from VWP recording negative pressures. Piezometers reporting as dry are not plotted in Appendix E.

Readings from PP-VWP-2018-01B, 02A, 02B, 05, 08 and PP-VWP-2018-09 were considered unreliable due to possible malfunction. The instruments are planned to be reviewed and trigger-action-response-plans (TARPs) developed for the TIA. Any malfunctioning instrument required for a TARP shall be repaired or replaced.

4.2.2 Main Pond Water Levels

Pond levels from May 2009 to September 2020 recorded at the staff gauge are presented in Illustration 4 and individual readings are presented in Appendix C. For clarity, only the maximum monthly recorded pond levels are presented in Illustration 4, along with the water levels during inspections and at the end of water treatment.

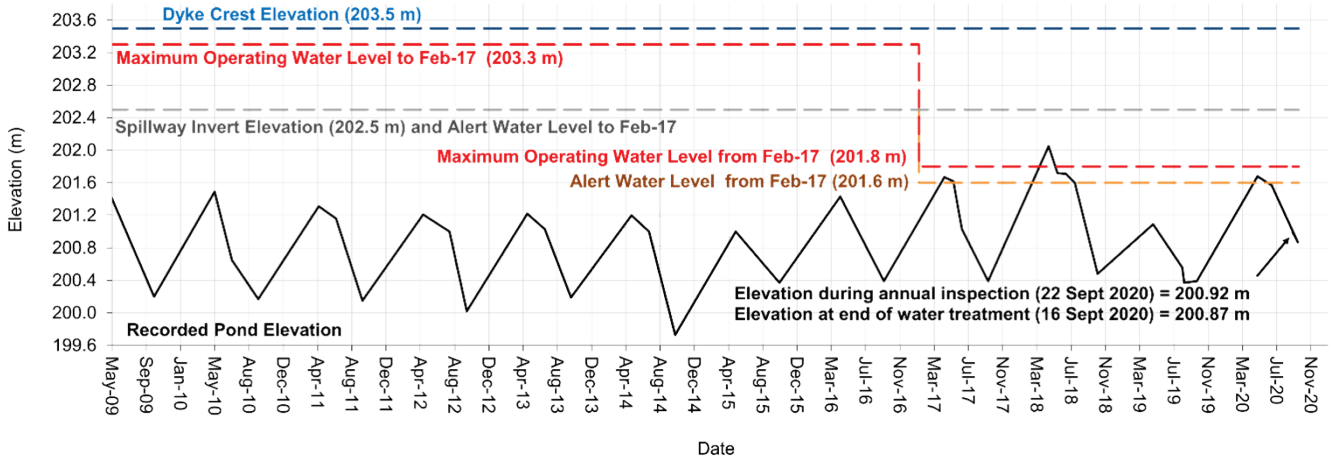
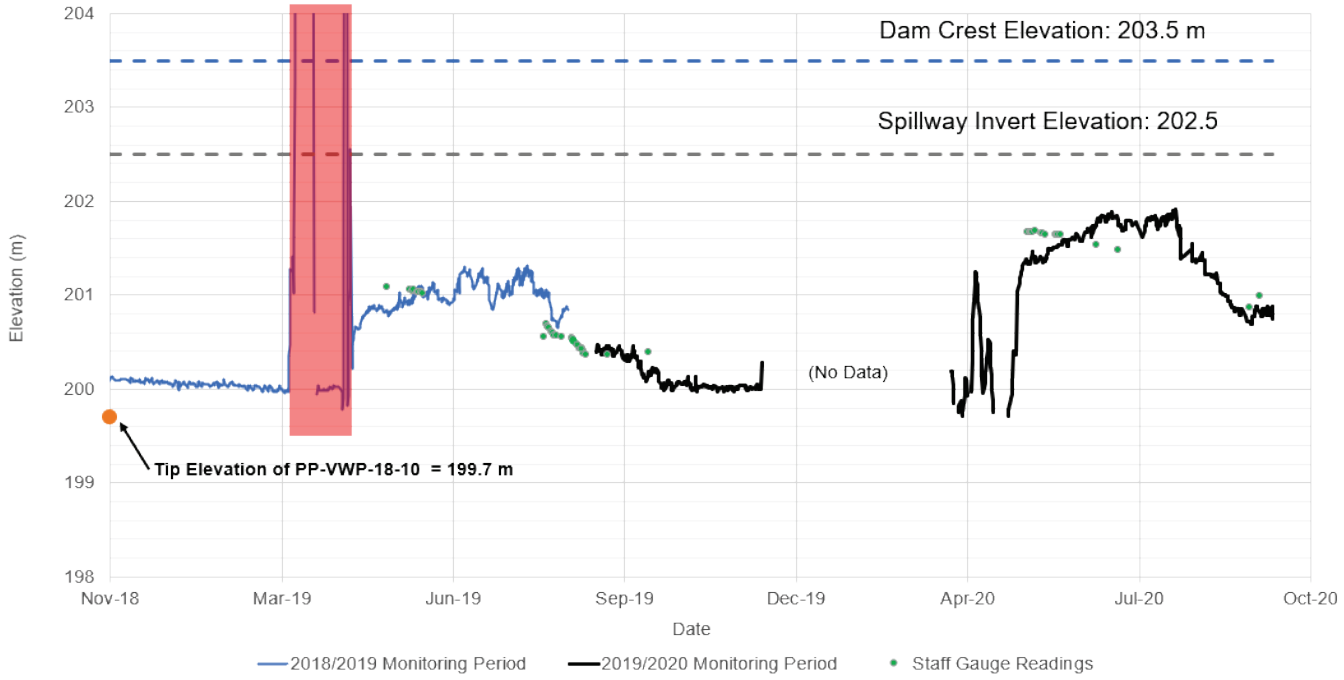


Illustration 4: Maximum Monthly Pond Level Measured by Staff Gauge – May 2009 to September 2020

See Section 3.3 for an explanation of water level limits/QPOs.

The maximum pond level observed at the polishing pond staff gauge in the monitoring period was 201.68 m, recorded on 14 May 2020. The maximum pond level was below the maximum operating water level of 201.8 m but above the alert water level of 201.6 m. When the alert level was triggered, pond level, climate data for precipitation, and climate forecasts were monitored as indicators of potential changes in pond level until the pond level dropped below the alert level of 201.6 m. Daily monitoring of climate and pond level was completed from 11 May to 19 June 2020, at which point the water level had dropped to 201.57 m. The water level continued to drop until the start of discharge as part of annual water treatment on 1 July 2020, when the water level was 201.48 m.

Main pond levels were also recorded at VWP PP-VWP-2018-10, installed in the pond, from November 2018 to September 2020, as presented in Illustration 5 along with elevations recorded at the staff gauge. Large increases in pressure over short periods are interpreted as errors, rather than rapid raising or lowering of the pond level and are partly attributed to freeze/thaw of the instrument. Point measurements of pond elevation at the staff gauge differed from readings at PP-VWP-2018-10 by up to 2.06 m. As a result, the data from PP-VWP-2018-10 are not considered to accurately reflect the level of the pond. Additional instruments were installed in September 2020 to monitor the pond level, including a vibrating wire piezometer in a deeper section of the pond near the dogleg, and a remote camera (webcam) with a view of the pond staff gauge.



Note: Readings corrected for barometric pressure.
Red shading indicates errors attributed to freeze/thaw.
Data in green from staff gauge readings.

Illustration 5: Main Pond Level Measured by Vibrating Wire Piezometer (PP-VWP-2018-10)

4.3 Pond Water Quality

Water quality of the site is reported in the 2020 Annual Water Licence Report submitted to Mackenzie Valley Land and Water Board.

4.4 Site Inspection Forms

A site inspection form for the 22 September 2020 site visit by Golder is provided in Appendix D.

5.0 DAM SAFETY ASSESSMENT

5.1 Dam Classification Review

Consequence classification is not related to the likelihood of a failure, but rather the potential impact if a hypothetical failure were to occur.

The CDA (2013) *Dam Safety Guidelines* present a dam classification system based on consequence of a hypothetical failure to define design requirements for water retaining structures and dams. The descriptions of the CDA (2013) dam classes are provided in Table 6.

Table 6: Dam Failure Consequence Classification

Dam Failure Consequences Classification	Population at Risk	Consequences of Failure		
		Loss of Life	Environment and Cultural Values	Infrastructure and Economics
Low	None[a]	There is no possibility of loss of life other than through unforeseeable misadventure	Minimal short-term loss or deterioration and no long-term loss or deterioration of: ■ fisheries habitat or wildlife habitat ■ rare or endangered species ■ unique landscapes or sites of cultural significance	Minimal economic losses mostly limited to the dam owner's property, with virtually no pre-existing potential for development within the dam inundation zone.
Significant	Temporary only[b]	Low potential for multiple loss of life	No significant loss or deterioration of: ■ important fisheries habitat or important wildlife habitat ■ rare or endangered species ■ unique landscapes or sites of cultural significance ■ restoration or compensation in kind is highly possible	Low economic losses affecting limited infrastructure and residential buildings, public transportation or services or commercial facilities, or some destruction of or damage to locations used occasionally and irregularly for temporary purposes.
High	Permanent[c]	10 or fewer	Significant loss or deterioration of: ■ important fisheries habitat or important wildlife habitat ■ rare or endangered species ■ unique landscapes or sites of cultural significance ■ restoration or compensation in kind is highly possible	High economic losses affecting infrastructure, public transportation or services or commercial facilities, or some destruction of or some severe damage to scattered residential buildings.
Very High	Permanent[c]	100 or fewer	Significant loss or deterioration of: ■ critical fisheries habitat or critical wildlife habitat ■ rare or endangered species ■ unique landscapes or sites of cultural significance ■ restoration or compensation in kind is possible but impractical	Very high economic losses affecting important infrastructure, public transportation or services or commercial facilities, or some destruction of or some severe damage to residential areas.
Extreme	Permanent[c]	More than 100	Major loss or deterioration of: ■ critical fisheries habitat or critical wildlife habitat ■ rare or endangered species ■ unique landscapes or sites of cultural significance ■ restoration or compensation in kind is impossible	Extremely high economic losses affecting critical infrastructure, public transportation or services or commercial facilities, or some destruction of or some severe damage to residential areas.

Source: CDA (2013).

(a) There is no identifiable population at risk.

(b) People are only occasionally and irregularly in the dam-breach inundation zone, for example stopping temporarily, passing through on transportation routes, or participating in recreational activities.

(c) The population at risk is ordinarily or regularly located in the dam-breach inundation zone, whether to live, work, or recreate.

Note 1. Definitions for populations at risk:

None – There is no identifiable population at risk, so there is no possibility of loss of life other than through unforeseeable misadventure.

Temporary – People are only temporarily in the dam-breach inundation zone (e.g., seasonal cottage use, passing through on transportation routes, participating in recreational activities).

Permanent – The population at risk is ordinarily located in the dam-breach inundation zone (e.g., as permanent residents); three consequence classes (high, very high, extreme) are proposed to allow for more detailed estimates of potential loss of life (to assist in decision-making if the appropriate analysis is carried out).

Note 2. Implications for loss of life:

Unspecified – The appropriate level of safety required at a dam where people are temporarily at risk depends on the number of people, the exposure time, the nature of their activity, and other conditions. A higher class could be appropriate, depending on the requirements. However, the design flood requirement, for example, might not be higher if the temporary population is not likely to be present during the flood season.

Dykes at the site are classified as “Low” to “Significant,” based on CDA (2013). Only the north dyke retains water at any time; the south and west dykes only retain tailings, while the east dyke does not retain water or tailings but is required for freeboard. The criteria for classification are evaluated as follows:

- **Population at risk**—There is the possibility of a temporary population downstream of the west and south dykes due to exploration works by an external third party. The south and west dykes do not retain water and as such are unlikely to constitute a risk to exploration activities.
- **Loss of life**—There is a low potential for multiple loss of life associated with the presence of exploration drilling work in the area. The south and west dykes do not retain water and as such are unlikely to constitute a risk to exploration activities.
- **Environmental and cultural values**—A dyke failure would impact the local environment. There is a possibility of minimal short-term loss or deterioration of wildlife habitat as a result of a failure of the south and east dykes. Failure of the north or west dykes presents a higher risk, due to the impoundment of water; however, failure would not lead to a significant loss or deterioration of important wildlife habitat or areas of cultural significance; restoration or compensation for impacts is considered highly possible.
- **Infrastructure and economics**—None. There is no development or infrastructure downstream of the TIA.

Consequence classifications are summarized in Table 7.

Table 7: Dam Failure Consequence Classification for the North, East, West, and South Dykes

Dam	Dam Class	Population at Risk	Consequences of Failure		
			Loss of Life	Environment and Cultural Values	Infrastructure and Economics
North dyke	Significant	none	low to none	low to significant	none
East dyke	Low	none	low to none	low	none
West dyke	Significant	none	low to none	low to significant	none
South dyke	Low	none	low to none	low	none

Further to criteria in the *Dam Safety Guidelines* (CDA 2013), the CDA has published a *Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams* (CDA 2019), which provides recommendations on criteria for different phases of mine life. The TIA is considered to be in the closure – active care phase of mine life, based on regular monitoring of the dykes and regular treatment and release of water from the facility. The design criteria for the dam therefore follow the CDA (2013) guidelines. Should the TIA move to the closure – passive care phase, where the system is considered stable, with no water treatment or regulation of the pond such that water may be passively released from the system, then the design criteria for the dam should be revisited based on recommendations of the CDA (2019).

5.2 Review of Downstream and Upstream Conditions

There are no known changes in the upstream or downstream conditions for the Pine Point TIA in the monitoring period that could conceivably result in a change in dam consequence classification.

Exploration activities by an external party were in progress at the Pine Point Mine during 2019/2020. The exploration activities are considered unlikely to affect the dam consequence classification.

5.3 Design Basis Review

The design criteria related to floods and seismic and static stability based on the CDA (2013) guidelines are summarized in Table 8.

Table 8: Minimum Design Criteria for the Pine Point Tailings Impoundment Area Dykes

Dykes	Dam Class	Annual Exceedance Probability – Floods	Annual Exceedance Probability – Earthquakes	Factors of Safety			
				Static		Pseudo-static	Post-earthquake
				Long-Term	Full or Partial Drawdown		
North and West	Significant	between 1/100 and 1/1,000	between 1/100 and 1/1,000	1.5	1.2–1.3	1.0	1.2–1.3
South and East	Low	1/100	1/100	1.5	1.2–1.3	1.0	1.2–1.3

Note: Design criteria based on CDA 2013.

In addition, CDA (2013) provides two calculations for freeboard; the most critical of the two scenarios sets the minimum freeboard to be adopted:

- **Scenario 1**—no overtopping by 95% of the waves caused by the most critical wind with a return period of 1,000 years with the pond at its maximum normal operating elevation.
- **Scenario 2**—no overtopping by 95% of the waves caused by the most critical wind with a return period of 10 years (for Significant consequence structures), with the pond at the maximum level during the passage of the inflow design flood.

Details of how the Pine Point TIA achieves the required design criteria are discussed relative to the potential credible failure modes in Sections 5.3.1 and 5.3.2.

5.3.1 Annual Exceedance Probability – Floods

An assessment of flood capacity to meet the CDA (2013) guidelines is provided in the OMS manual (Teck 2020b). The net annual precipitation volumes for the 1-in-100-year and 1-in-1,000-year return events from Teck (2020b) are presented in Table 9. Criteria for flood storage and freeboard are planned to be updated.

Table 9: Flood Capacity Analysis for Extreme Annual Total Precipitation Events

Return Period (years)	Total Annual Precipitation (mm)	Total Annual Losses[(c)] (mm)	Net Annual Precipitation[(d)] (mm)	Net Annual Precipitation Volume[(e)] (m^3)
100[(a)]	742	709	33	301,178
1,000[(b)]	844	806	38	342,580

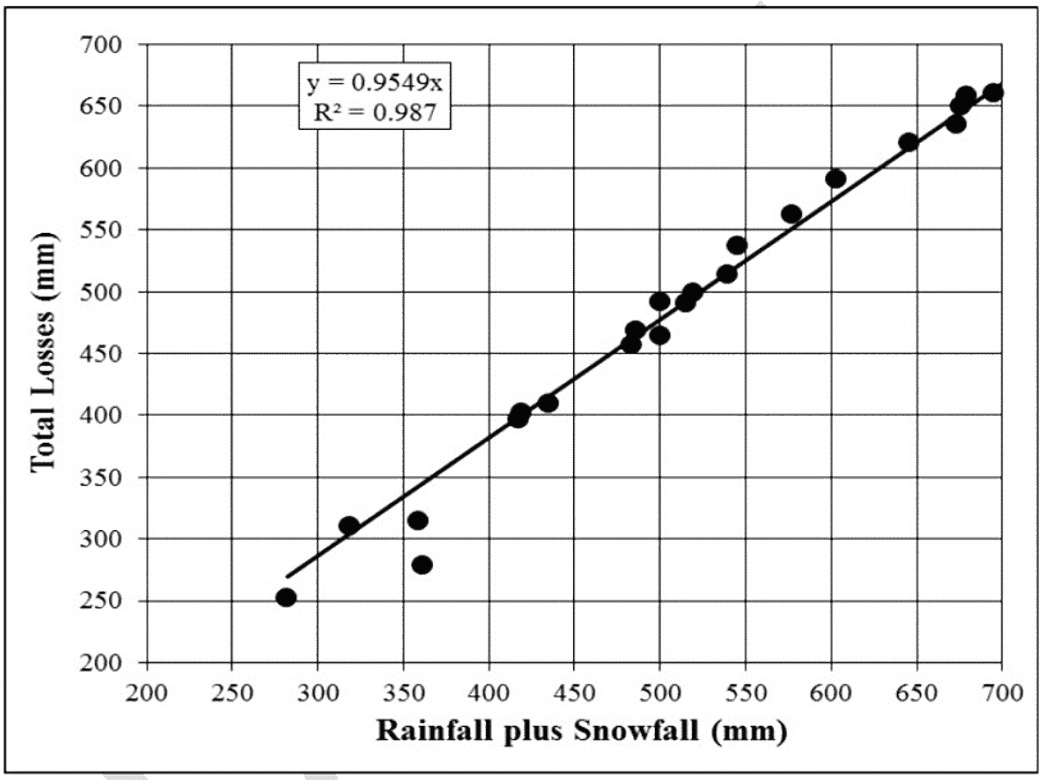
(a) Design event for south and east dykes.

(b) Design event for north and west dykes.

(c) Total annual losses include evaporation, evapotranspiration, seepage, and infiltration. Total losses are calculated based on the relationship between total precipitation and total losses presented in Illustration 6.

(d) Net annual precipitation is total annual precipitation minus total annual losses.

(e) Net annual precipitation volume is net annual precipitation multiplied by a watershed area of 9 km^2.



Source: Teck 2020b.

Illustration 6: Correlation between Total Losses and Total Precipitation

5.3.2 Annual Exceedance Probability – Earthquakes

According to the 2015 National Building Code of Canada seismic hazard calculator (NRC 2015), peak ground acceleration for the Pine Point Mine site is:

- 0.002 g for the 1-in-100-year event (40% probability of exceedance in 50 years)
- 0.016 g for the 1-in-1,000-year event (5% probability of exceedance in 50 years)

The 2015 seismic information is the most recent available from Natural Resources Canada.

5.4 Hazard and Failure Modes Review

The dykes at the Pine Point TIA were evaluated against credible failure modes at the Pine Point TIA which could impact dyke safety:

- **Overtopping**—occurs when the pond level rises above the dyke crest level, resulting in flow over the dyke that may cause progressive erosion of the dyke and loss of the pond and tailings.
- **Piping**—occurs when there is development of internal erosion. This erosion can lead to loss of material, formation of a hole in the dyke, and rapid loss of water and tailings from the storage pond.
- **Instability**—occurs due to imbalance of forces resulting in movement of a part of the dyke with possible loss of integrity of the dyke.
- **Erosion**—occurs from either wave action or surface run-off, resulting in a loss of the dyke cross-section.

Additional failure modes are not considered credible for the Pine Point TIA and are therefore not discussed.

5.4.1 Overtopping

Design Basis

The CDA (2013) provides two calculations for freeboard (vertical distance between the dyke crest and the pond water); the more critical of the two scenarios sets the minimum freeboard.

The minimum freeboard (1.7 m) was updated as part of Teck (2017a) and carried in Teck (2020b).

Instrumentation – Water Level Gauge

Maximum monthly readings from the main pond staff gauge from May 2009 to September 2020 are presented in Illustration 4, and individual values are presented in Appendix C.

The staff gauge is installed to a datum at 201.032 m (i.e., reads 0 m), which is the elevation of the top of the flange of the culvert inlet between the main and polishing ponds, and does not read freeboard directly. The pond level is calculated with reference to the datum.

As discussed in Section 4.2.2, Instrument PP-VWP-2018-10 was installed in the main pond, but to date readings have not been representative of the pond level. A vibrating wire piezometer (PP-VWP-2020-12) was installed in a deeper portion of the pond and a camera was installed to remotely monitor the staff gauge in September 2020.

Observed Performance

- Minimum freeboard from dam crest to the main pond in the TIA was established based on Canadian Dam Association (CDA 2013) guidelines.
- The pond level was below the maximum operating level of 201.8 m during the monitoring period.
- The pond level was above the alert level of 201.6 m from 11 May to 19 June 2020, reaching a maximum level of 201.68 m on 14 May 2020.
- The pond level at the end of water treatment in September 2020 was higher than typical levels at the end of water treatment. The higher pond level will reduce storage capacity for the freshet in spring 2021.
- Sludge and soil from water treatment stacked in the northeast corner of the facility was higher than the dyke crest. If material were stacked high enough, then there is a risk that with instability material could be lost from the facility. Golder understands the material was tamped down in October 2020.

5.4.2 Piping

Internal instability of a dyke can be caused by materials migrating out of the dyke caused by seepage of water passing through the dyke, leaving voids. Piping can only occur where materials do not have filter compatibility such that the fines fraction of one material can migrate into or through the voids of an adjacent material under a sufficient hydraulic gradient. Piping is induced by regressive erosion of particles towards an outside environment until a continuous pipe is formed. Piping failure modes can occur along conduits or pipes through a dyke structure but can also occur through any soils subject to seepage pressures where soil layers fail to meet filter criteria for particle size.

Design Basis

Limited records from the construction of the dykes are available, and no record was available of filter compatibility assessment between the tailings and the dyke construction fills. Evaluation of filter compatibility was planned for 2021 based on data from the 2018 and 2020 site investigations.

Observed Performance

At the time of the 2020 annual inspection, the only significant volume of free water in the TIA was ponded against a portion of the north dyke (similar to the conditions shown in Figure 2). The maximum hydraulic gradient through the dyke was calculated as 0.12 based on: 1) an upstream water level of the maximum pond level recorded at the staff gauge in 2020 (201.68 m) and 2) an assumed water table at the level of the downstream dyke toe at the highest section of the north dyke adjacent to the pond.

One seep, with red staining was observed at a rate of <1 L/minute at the downstream toe of the north dyke near the dogleg. No sediment was observed in the seepage. There were no other visible signs of seepage through the dykes during inspections. However, vegetation growth continued to develop at the outside toe of portions of the north, west, and south dykes, which is considered indicative of soil moisture in these areas, similar to conditions in 2019. Ponded water at the downstream toe of the dykes may or may not be indicative of seepage through the dykes. Some of the wet areas beyond the perimeter of the TIA were attributed to run-off of surface water and were not considered indicative of seepage.

Some seepage is considered normal.

Erosion rills on the north and west dyke downstream slopes were not considered to be related to a piping failure, as there was no pond in the TIA adjacent to the rills.

5.4.3 Instability

Design Basis

A stability review was completed as part of the 2014 dam safety review (SRK 2016). The analyses results indicated the dykes met criteria for stability under static and pseudo-static (seismic) loading conditions. This analysis used a horizontal peak ground acceleration of 0.019 g, based on the 2010 National Building Code seismic hazard calculator (NRC 2011) for the 1-in-1,000-year event. This value is higher than the peak ground acceleration (0.016 g) calculated based on the updated 2015 National Building Code seismic hazard calculator (NRC 2015) for the 1-in-1,000-year event (Section 5.3.2).

All analyses were conducted based on sections and material properties determined as part of the 1981 geotechnical investigation stability report (Golder 1981), with some modification to the shear strength of the foundation materials. Update of the stability analyses for the dykes, including consideration of data from investigations in 2018 and 2020, and considering piezometers installed in the dykes and foundations is planned in 2021.

Observed Performance

The inspections during 2020 did not identify any signs of slope instability such as cracks, settling, or bulging.

Surface erosion, including wave erosion on the upstream slope of the north dyke, rilling on the dyke slopes, and ruts in the dam crest due to vehicle traffic are surficial, and are not considered to materially increase the risk of dam instability.

The condition of the dykes has otherwise remained unchanged with respect to slope stability from previous site visits. The dyke slopes appeared to be stable and, as a result, the overall stability of the perimeter dykes has continued to be satisfactory.

Piezometric data were reviewed for increasing trends that may indicate a decrease in stability. Data were generally uncorrected for barometric pressure changes and individual piezometer data are presented in Appendix E, except where instruments were dry throughout the monitoring period. The review did not indicate conditions which may promote dam instability.

5.4.4 Erosion

There are two types of surface erosion occurring at the Pine Point TIA. These are:

- **Wave cut erosion**—Wave cut erosion was present on the upstream slope (tailings side) of the north dyke caused by high water levels, and associated wind-driven erosion or possibly ice action. Erosion had occurred previously and was repaired in 2008 with a rebuilt slope developed at 2 horizontal to 1 vertical, and in 2018, where riprap was placed over the upstream slope of a 700 m section of the north dyke.
  - The 2018 riprap repairs were in good condition on 22 September 2020. A step in the slope below the riprap was not visible in 2020.
  - The section east of the 2018 repair had undersized riprap and a 30 m scarp with exposed dam core. The conditions in 2020 were similar to those observed in the 2019 inspection. The area should continue to be monitored as part of routine inspections.
- **Surface erosion rills (gullies)**
  - Higher than average rainfall in 2020 resulted in increased (depth and frequency) erosion and rilling based on year to year comparison than observed in recent years. Maintenance repairs were completed in September 2020 for rills that were encroaching on the crest of the dyke and/or more than 30 cm deep. Erosion of the lower downstream slope of the west dyke was observed over larger areas, but rilling was limited to the lower slope beyond a step in the slope, and therefore not an immediate risk to dam safety.
  - The west dyke had rills up to 30 cm deep on the upstream and downstream slopes.
    - In the central portion of the west dyke the downstream slope had extensive rilling with local accumulation of fines at the toe of the slope over a length approximately 350 m. Two rills had sharper unweathered edges and were 0.4 to 0.5 m deep and 1.7 m wide. At several locations rills joined lower on the slope.
    - The rills were confined to the lower downstream slope, which steps out, and rills did not extend into the dam crest.
    - The area should continue to be monitored, and planning should consider restoring the slope in a future maintenance campaign.
  - The north dyke had rills up to 30 cm deep on the upstream and downstream slopes.
    - One rill was repaired on the downstream slope of the north dyke on 29 September 2020, near the west dyke. The rill was first observed during the spring routine inspection and was approximately 80 cm deep and 1 m wide.

- One rill was repaired on the upstream slope of the north dyke on 29 September 2020, just east of the polishing pond. The rill had cut back into the dam crest.

Erosion is typically progressive, and is required to be monitored, with maintenance completed in accordance with the requirements of the OMS manual (Teck 2020b).

5.5 Operational Performance

The Pine Point TIA is a closed site, with no ongoing operations during the monitoring period.

Details of maintenance and activities during the monitoring period are provided in Section 2.0.

Details of water treatment and discharge during the monitoring period are provided in Section 2.0 and Section 3.0.

5.6 Operation, Maintenance, and Surveillance Manual Review

Version 5 of the OMS manual was issued in May 2020 (Teck 2020b). Updates included the addition of a requirement to update emergency response documentation.

5.7 Mine Emergency Response Plan Review

The emergency preparedness and response plan (EPRP) was incorporated within and replaced by a mine emergency response plan (MERP) in 2020 (Teck 2020a).

5.8 Dam Safety Review

A dam safety review of the north, south, and west dykes was conducted by SRK Consulting Inc. in 2014 (SRK 2016). CDA (2013) guidelines recommend that a dam safety review be conducted once every 10 years for embankments with a Significant dam classification, such as the west and north TIA dykes. Based on CDA guidance, the next dam safety review for the west and north TIA dykes is to be undertaken no later than the end of 2024.

6.0 SUMMARY AND RECOMMENDATIONS

6.1 Summary of Construction and Activities

The following activities were completed at the Pine Point TIA in the monitoring period:

- Routine inspections on 2 October 2019 and 18 May 2020.
- Annual inspection on 22 September 2020.
- The annual water treatment campaign was carried out, as described in Sections 3.4 and 3.5.
  - Water treatment started 1 July and finished 16 September 2020.
- Data collection from monitoring instrumentation installed in 2018.
- Site investigations including installation of instrumentation.
  - Installation of 4 vibrating wire piezometers as part of site investigations in September 2020.
  - Installation of a remote view camera to monitor the main pond staff gauge, installed in September 2020.
  - Installation of 6 groundwater monitoring wells in September/October 2019.
- Maintenance repairs of 5 rills and dam ruts identified during the annual site inspection were completed between 22 and 29 September 2020.
- Vegetation clearance on west end of the south dyke in September/October 2019.
- Ongoing closure and reclamation planning activities.

6.2 Summary of Climate and Water Balance

During the period of 1 September 2019 to 31 August 2020, the total annual precipitation was 531 mm, which was approximately 70 mm (15%) higher than the long-term average. Rainfall during July and August 2020 was more than double the average.

Higher precipitation than average in the monitoring period resulted in higher inflows into the TIA, higher pond water levels, and more treated discharge over the monitoring period compared to previous years. A total volume of 383,451 m^3 of treated water released between 1 July 2020 and 16 September 2020, which was 46% more than the historical average of approximately 262,250 m^3.

6.3 Summary of Performance

Overall, the dykes appear to be in good condition and were achieving their intended purpose of retaining the tailings and ponded water in a satisfactory manner.

No significant changes to dyke stability were observed. Overall stability of the dykes was therefore unchanged from the 2019 dam safety inspection.

Higher than average precipitation resulted in progression of erosion of the dykes as surficial rills.

The repairs to the north dyke wave run-up erosion were observed to be in good condition. Sections of the north dyke upstream slope to the east of the repairs are faced with undersized riprap and had a 30 cm scarp with exposed core that appeared stable.

Maintenance of eroded areas of the west dyke downstream slope and the north dyke upstream slope may be required in the next few years, depending on how erosion progresses. These areas should continue to be monitored as part of routine inspections.

6.4 Consequence Classification

The dam consequence classifications, presented in Section 5.1, are unchanged in 2020, based on CDA (2013):

- north dyke: Significant (based on environment and cultural values)
- west dyke: Significant (based on environment and cultural values)
- east dyke: Low
- south dyke: Low

There have been no significant changes in the regulations, potential downstream receptors, or the nature of the structures since 2019. Changes in guidelines and standards include the issue of the Global Standard on Tailings Management (GTR 2020) in August 2020, which had not been interpreted with respect to the Pine Point TIA at the time of issue of this report.

6.5 Table of Deficiencies and Non-conformances

Table 10 summarizes deficiencies/non-conformances and recommended actions for the Pine Point TIA.

Table 10: Summary of Annual Inspection Recommended Actions

Structure	ID Number	Deficiency or Non-conformance	Applicable Regulation or Manual Reference	Recommended Action	Priority	Recommended Deadline/Status as of 08 December 2020
Polishing pond	2018-2	No written procedure for sludge removal	none	Update Water Treatment Manual to include written maintenance procedure for removal of sludge from polishing pond including dewatering operations.	4	Closed – Incorporated in V003 of the Water Treatment Manual (30 April 2020).
TIA	2018-3	Inaccurate storage curve for facility	4.3.3 of OMS Manual	Complete bathymetry and tailings topographic survey to define the facility storage curve. Review flood storage capacity and water handling practices, determine capacity of spillway and update freeboard limits. Incorporate these changes in the OMS manual. Consider preparing for high water levels in spring 2019 and requirement to treat water at freshet.	2	Closed 2020 Survey was completed Q1 2019 and the 2019 freshet has passed. Remaining actions are moved to 2020-03.
North dyke	2019-1	Vibrating wire piezometers – faulty readings. PP-VWP-2018-01B PP-VWP-2018-02A PP-VWP-2018-02B PP-VWP-2018-08 PP-VWP-2018-09	none	Troubleshoot vibrating wire piezometer calibration / data acquisition and data reduction. Faulty or damaged instruments should be repaired or replaced.	4	Deadline updated to by end of Q4, 2021. Faulty instruments that are identified to be required for trigger-action-response-plans (planned) should be replaced.
TIA Instrumentation	2019-2	Instrumentation installed in 2018 requires integration into OMS procedures	4.2 and 4.3 of OMS manual	Establish procedures for frequency of data acquisition and review. Establish baseline readings and levels for alert and emergency response, with corresponding update of OMS manual.	4	Deadline updated to by end of Q4, 2021 / in progress
TIA	2019-3	EPRP is out of date and does not reflect recent staff changes	CDA 2013	Update EPRP for changes to site manager and Engineer of Record. ■ Update OMS manual to include change management procedure to update EPRP.	4	Closed – Incorporated in V005 of the OMS manual (1 May 2020) and V0.2 of the MERP (31 March 2020).
TIA	2020-01	Erosion rills require maintenance.	5.5 and 5.6 of OMS	The following erosion rills require maintenance: ■ south dyke - 3 rills on upstream slope at east end ■ north dyke – 1 rill on the downstream slope approximately 25 m east of the north west corner ■ north dyke – 1 rill on the upstream slope east of the polishing pond	4	Closed Maintenance completed September 2020.
TIA	2020-02	Pond water at 200.92 m, which is higher than historic levels following water treatment, with reduced storage capacity for the 2021 freshet.	1.0 Water Treatment Manual	Prepare an interim plan to manage 2021 freshet.	3	Q2 2021 (freshet).
TIA	2020-03	Freeboard limits require update for 2019 storage curve, 2020 climate assessment, review of design criteria, and evaluation of spillway capacity.	OMS Manual 2.7.3.2.3	a) Define interim freeboard limits (support 2020-02). b) Review flood storage capacity, water handling practices, determine capacity of spillway and update freeboard limits. Incorporate these changes in the OMS manual.	3	a) Q1 2021 b) Q4 2021

Priority[a]	Description
1	High probability or dam safety issue considered immediately dangerous to life, health or the environment, or a significant risk of regulatory enforcement.
2	If not corrected/implemented could likely result in dam safety issues leading to injury, environmental impact or significant regulatory enforcement; or, a repetitive deficiency that demonstrates a systematic breakdown of procedures.
3	Single occurrences of deficiencies or non-conformances that alone would not be expected to result in dam safety issues.
4	Best Management Practice – Further improvements are necessary to meet industry best practices or reduce potential risks.

a) Source: Teck 2019.

ID = identification; OMS = operation, maintenance, and surveillance; TIA = tailings impoundment area; CDA = Canadian Dam Association; EPRP = Emergency Preparedness and Response Plan; MERP = Mine Emergency Response Plan.

6.6 Ongoing/Planned Work

Ongoing and planned work at the Pine Point TIA includes:

- Baseline hydrology report
- Factual reporting of investigations completed in 2020, with establishment of baseline readings of installed instrumentation
- Geotechnical and hydrotechnical analyses and compilation of dam construction record, dam site characterization report and dam design report
  - Review of climate data and design criteria for flood storage and freeboard was ongoing at the time of preparation of this report. The review will inform planning for management of the 2021 freshet, freeboard limits, and updates of the OMS manual (2020-02 and 2020-03).
- Closure planning
  - Planning for maintenance of the TIA should consider long term planning for closure.

7.0 CLOSURE

This report is to be read with the Study Limitations section, provided at the end of the report, which forms an integral part of this document.

Should you have any questions or require additional information please contact the undersigned.

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Geotechnical Engineer

Ben Wickland, Ph.D., P.Eng.
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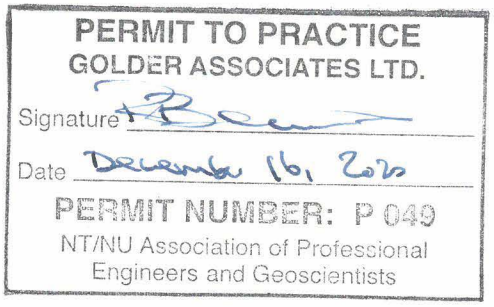

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STUDY LIMITATIONS

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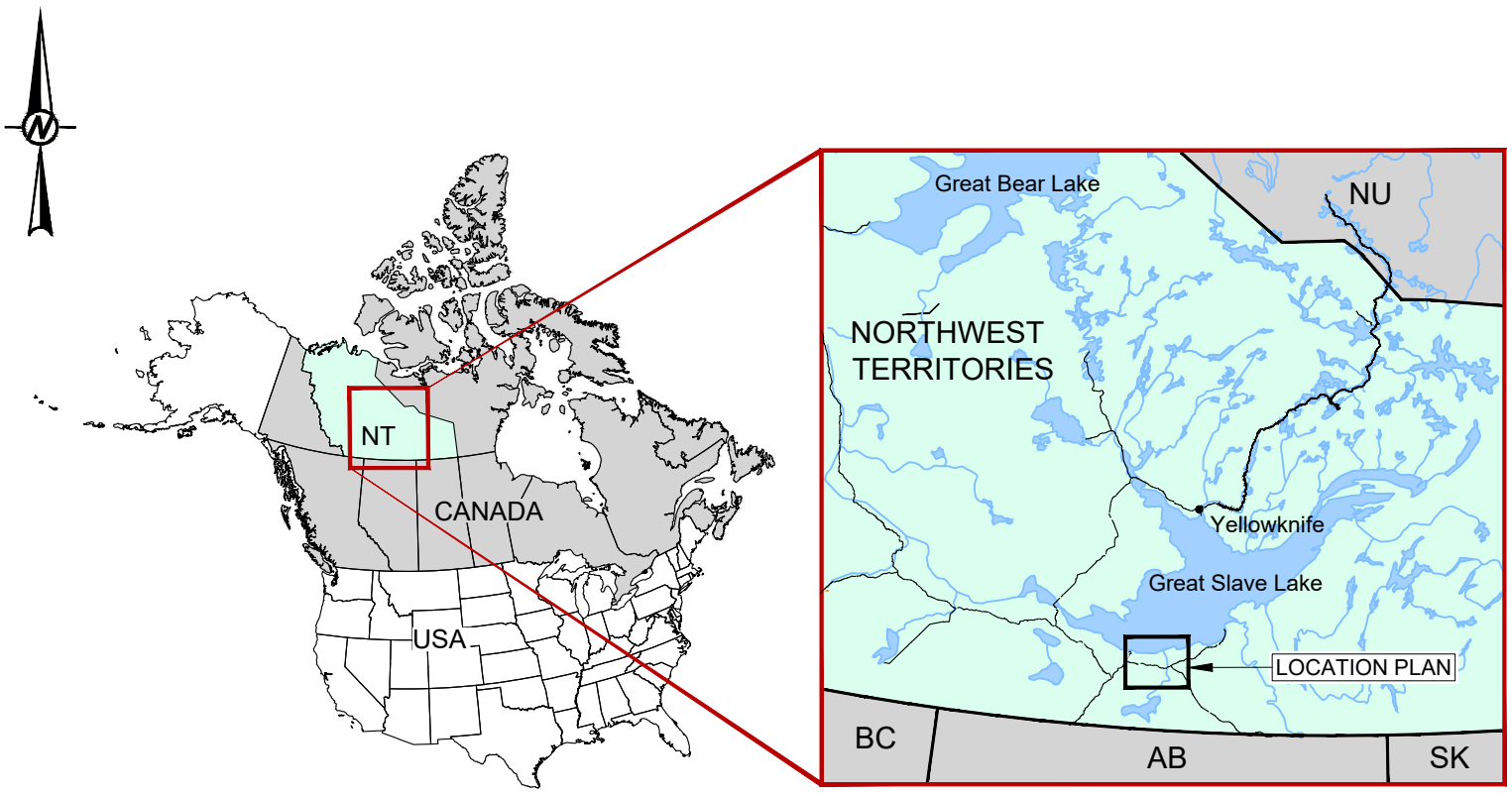

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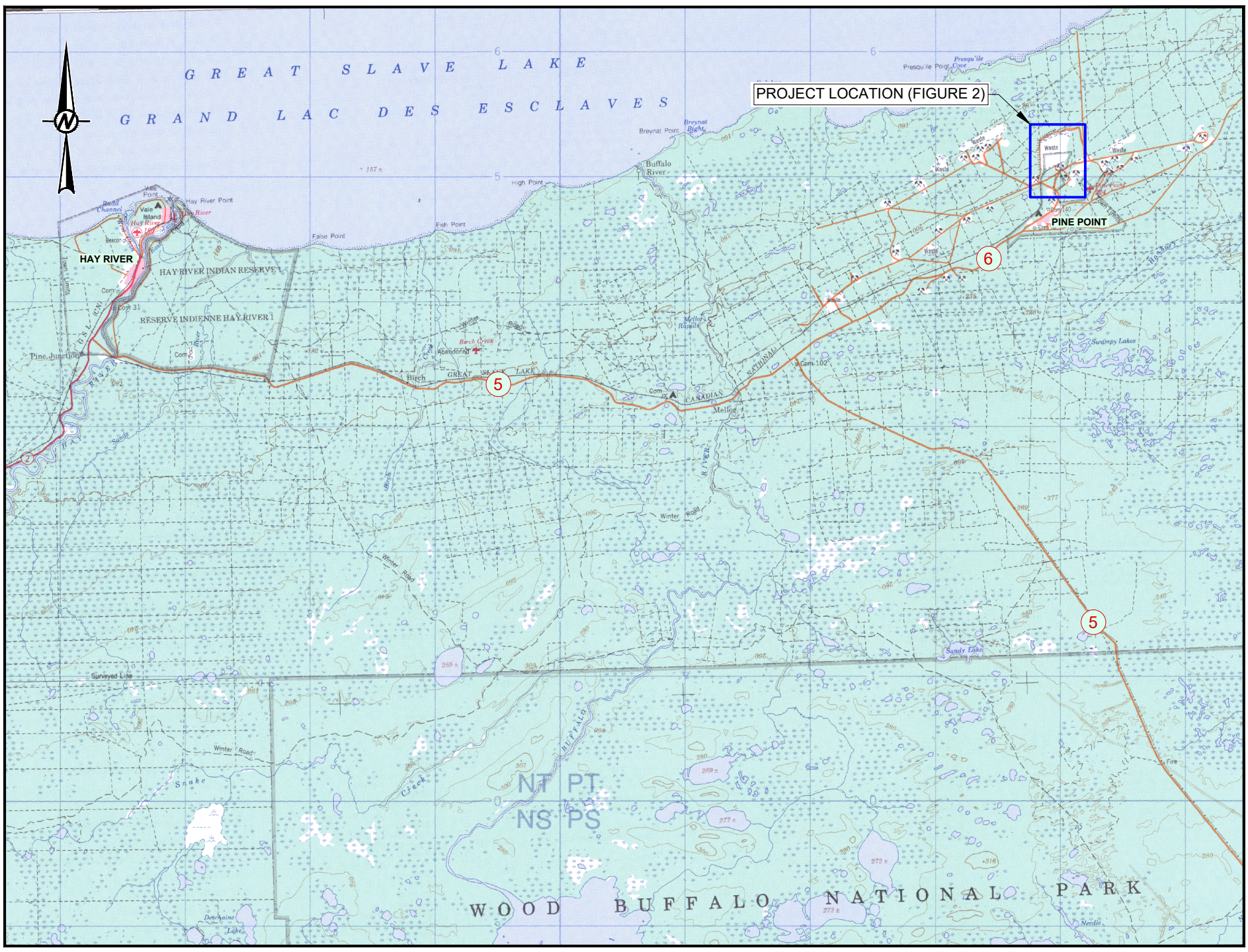

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SCALE 1:400,000

LEGEND

	PROJECT LOCATION
5	HIGHWAY 5
6	HIGHWAY 6

NOTE

1. THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE REPORT: 2020 ANNUAL INSPECTION PINE POINT TAILINGS IMPOUNDMENT AREA, PINE POINT, NT, REFERENCE NO. 20140895-279-R-REV0-1000.

REFERENCE

1. TOPOGRAPHIC MAP 85B © 1988 HER MAJESTY THE QUEEN IN RIGHT OF CANADA. DEPARTMENT OF NATURAL RESOURCES. ALL RIGHTS RESERVED. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD27, COORDINATE SYSTEM: UTM ZONE 11.

0 10 20
1:400,000 KILOMETRES

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GOLDER

YYYY-MM-DD	2020-12-14
DESIGNED	H. ROBERTS
PREPARED	A. WANG
REVIEWED	M. WILLAN
APPROVED	B. WICKLAND

PROJECT
PINE POINT TAILINGS IMPOUNDMENT AREA
2020 ANNUAL INSPECTION
PINE POINT, NT

TITLE
SITE LOCATION PLAN

PROJECT NO.	PHASE/TASK/DOC.	REV.	FIGURE
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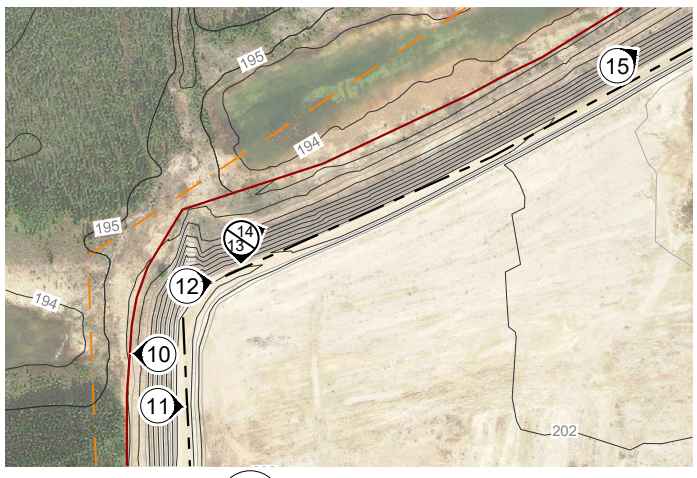

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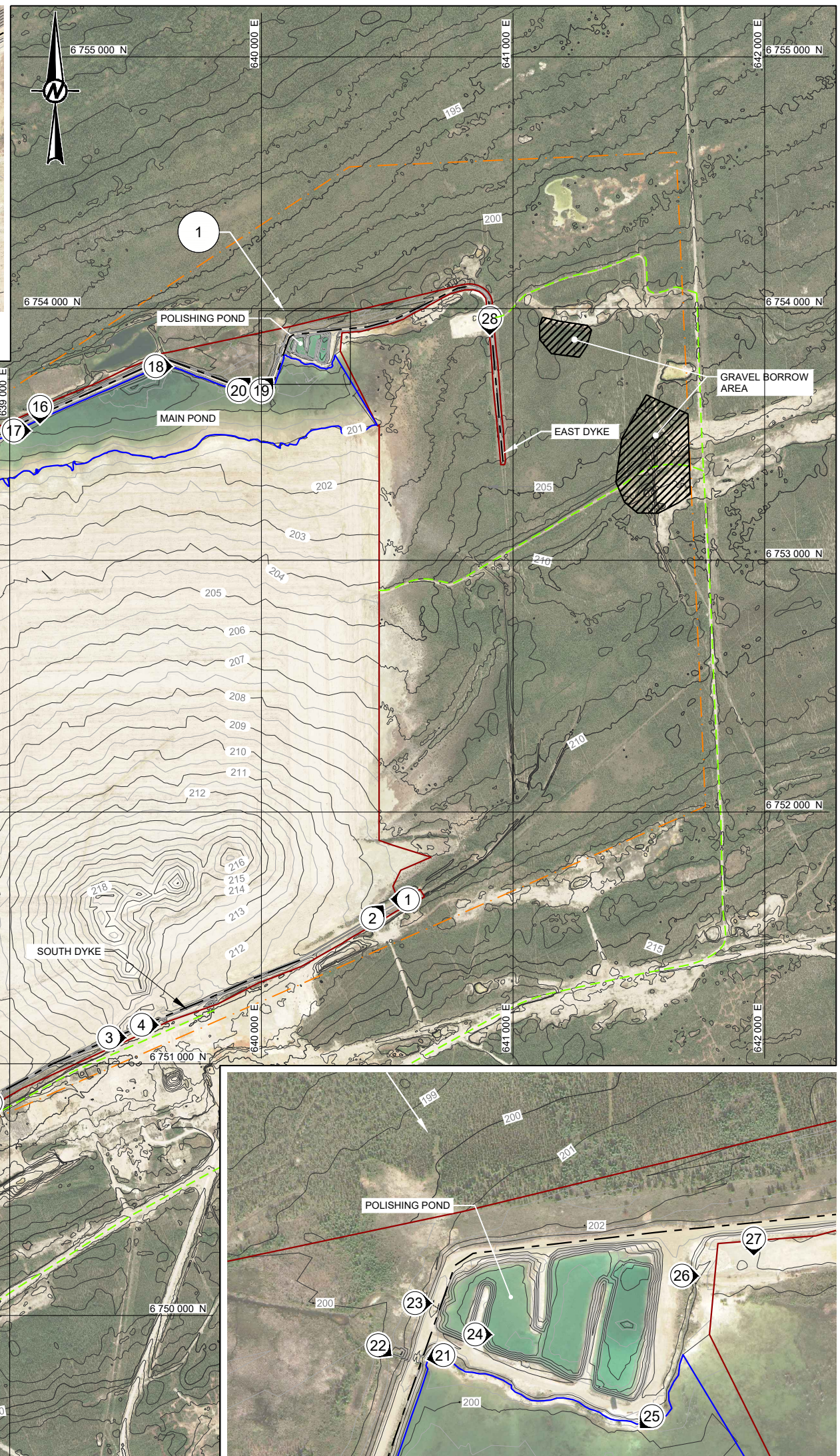
SITE PLAN
SCALE 1:20,000



SCALE 1:4,000 (1) POLISHING POND DETAIL

LEGEND

- (3) PHOTO LOCATION AND DIRECTION (APPENDIX D)
- APPROX. DYKE CRESTS
- APPROX. SURFACE LEASE BOUNDARY (SEE REFERENCE 1)
- EXTENT OF MAIN POND (SEE REFERENCE 2)
- MAJOR TOPOGRAPHIC CONTOUR (INTERVAL = 1 m)
- MINOR TOPOGRAPHIC CONTOUR (INTERVAL = 0.5 m)
- EXTENT OF TOPOGRAPHIC/BATHYMETRIC SURVEY (SEE REFERENCE 2)
- TAILINGS IMPOUNDMENT AREA ACCESS ROAD

NOTES

1. ALL UNITS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. GRID IS DISPLAYED IN UTM NAD83, ZONE 11. ELEVATIONS SHOWN IN METRES, DATUM: NAVD83.
3. THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE REPORT: 2020 ANNUAL INSPECTION PINE POINT TAILINGS IMPOUNDMENT AREA, PINE POINT, NT, REFERENCE NO. 20140895-279-R-REV0-1000.

REFERENCES

1. SURFACE LEASE BOUNDARY OBTAINED FROM BARR ENGINEERING LTD., TYPE A LAND USE PERMIT MV2019X0006, VALID TO 15 MAY 2024, AN AMENDMENT TO THE LAND USE BOUNDARY WAS GRANTED 17 SEPTEMBER 2020 TO INCORPORATE LEASE BOUNDARY L-2000009T.
2. IMPOUNDMENT AREA TOPOGRAPHIC AND BATHYMETRIC SURVEY BY MASKWA ENGINEERING LTD., FILENAME: 18-034 PINE POINT TAILINGS TOPO SURVEY.DWG. SURVEY DATE: 2019-06-26, ORIGINAL SCALE 1:15,000. RECEIVED: 2019-08-12.
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GOLDER

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PREPARED	A. WANG
REVIEWED	M. WILLAN
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PROJECT
PINE POINT TAILINGS IMPOUNDMENT AREA
2020 ANNUAL INSPECTION
PINE POINT, NT

TITLE
SITE LAYOUT AND INSPECTION PHOTOGRAPH LOCATIONS

PROJECT NO.	PHASE/TASK/DOC.	REV.	FIGURE
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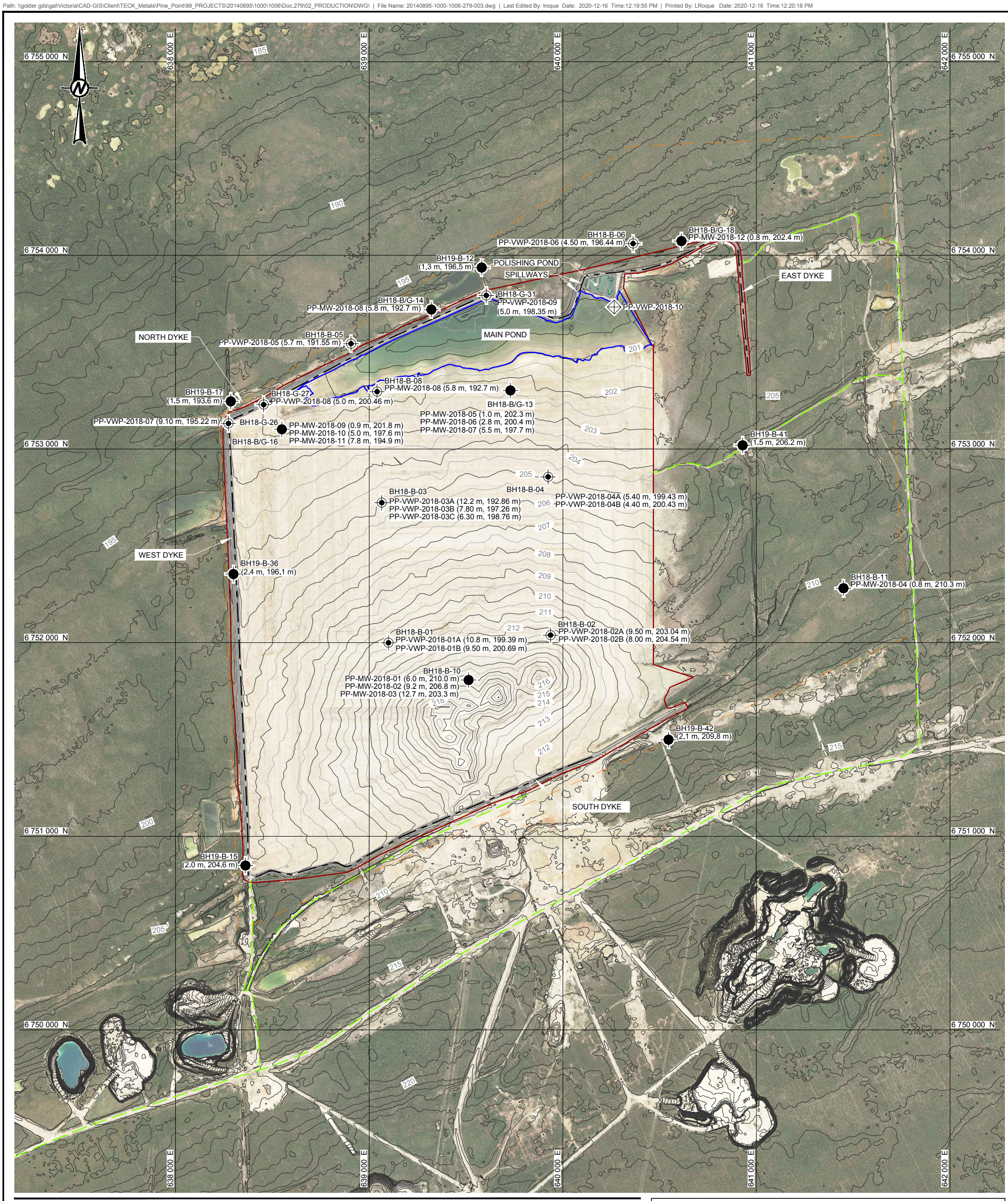

INVESTIGATION NAMING CONVENTION

BH18-B/G-01

- BH - BOREHOLE (TYPE)
- 18 (YEAR)
- B - BARR, G - GOLDER, B/G - BARR AND GOLDER (CONSULTANT)

PIEZOMETER INSTALL — *PP-VWP-2018-02A (8.00 m, 10 m)*

- PP - VIBRATING WIRE PIEZOMETER (PINE POINT)
- VW (VIBRATING WIRE PIEZOMETER)
- 2018 (YEAR)
- 02 (NUMBER)
- A (DEPTH OF TIP m, ELEVATION OF TIP m)

MONITORING WELL INSTALL — *PP-MW-2018-02A (9.22 m, 16 m)*

- PP - MONITORING WELL (PINE POINT)
- MW (MONITORING WELL)
- 2018 (YEAR)
- 02 (NUMBER)
- A (DEPTH TO TOP OF SCREEN m, ELEVATION OF TOP OF SCREEN m)

LEGEND

- BOREHOLE WITH MONITORING WELL
- BOREHOLE WITH PIEZOMETER
- MAIN POND PIEZOMETER
- APPROXIMATE DYKE CRESTS
- APPROXIMATE SURFACE LEASE BOUNDARY (SEE REFERENCE 1)
- EXTENT OF MAIN POND (SEE REFERENCE 2)
- MAJOR TOPOGRAPHIC CONTOUR (INTERVAL = 1 m)
- MINOR TOPOGRAPHIC CONTOUR (INTERVAL = 0.5 m)
- EXTENT OF TOPOGRAPHIC/BATHYMETRIC SURVEY (SEE REFERENCE 2)
- TAILINGS IMPOUNDMENT AREA ACCESS ROAD

NOTES

1. ALL UNITS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
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REFERENCES

1. SURFACE LEASE BOUNDARY OBTAINED FROM BARR ENGINEERING LTD., TYPE A LAND USE PERMIT MV2019X0006, VALID TO 15 MAY 2024, AN AMENDMENT TO THE LAND USE BOUNDARY WAS GRANTED 17 SEPTEMBER 2020 TO INCORPORATE LEASE BOUNDARY L-2000009T.
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CLIENT
TECK METALS LTD.

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GOLDER

YYYY-MM-DD	2020-12-14
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PREPARED	A. WANG
REVIEWED	M. WILLAN
APPROVED	B. WICKLAND

PROJECT
PINE POINT TAILINGS IMPOUNDMENT AREA
2020 ANNUAL INSPECTION
PINE POINT, NT

TITLE
TAILINGS IMPOUNDMENT AREA INSTRUMENTATION LOCATIONS

PROJECT NO.	PHASE/TASK/DOC.	REV.	FIGURE
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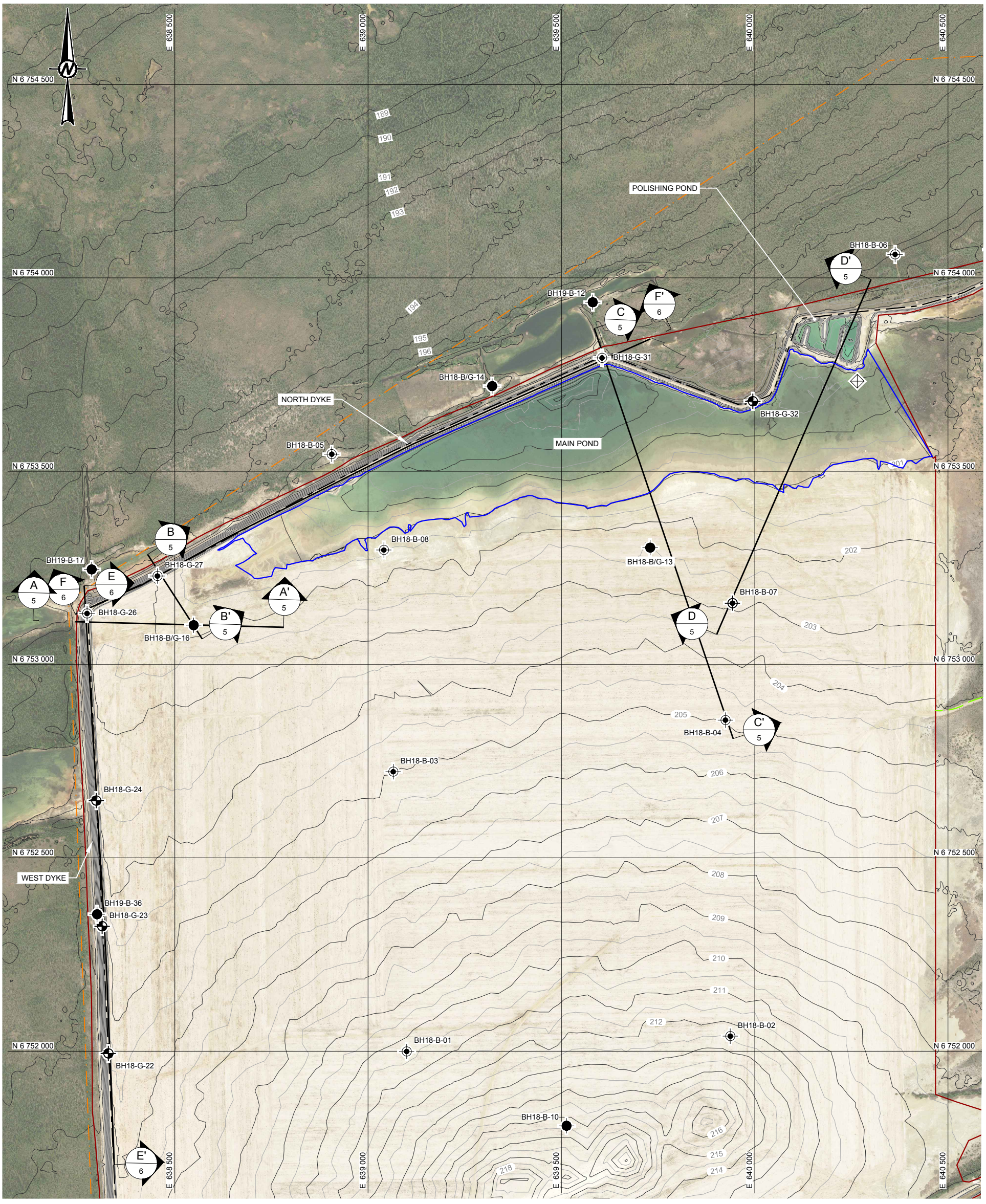

LEGEND

- BOREHOLE
- BOREHOLE WITH MONITORING WELL
- BOREHOLE WITH PIEZOMETER
- MAIN POND PIEZOMETER
- APPROXIMATE DYKE CRESTS
- APPROXIMATE SURFACE LEASE BOUNDARY (SEE REFERENCE 1)
- EXTENT OF MAIN POND (SEE REFERENCE 2)
- MAJOR TOPOGRAPHIC CONTOUR (INTERVAL = 1 m)
- MINOR TOPOGRAPHIC CONTOUR (INTERVAL = 0.5 m)
- EXTENT OF TOPOGRAPHIC/BATHYMETRIC SURVEY (SEE REFERENCE 2)
- TAILINGS IMPOUNDMENT AREA ACCESS ROAD

NOTES

1. ALL UNITS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. GRID IS DISPLAYED IN UTM NAD83, ZONE 11. ELEVATIONS SHOWN IN METRES, DATUM: NAVD83.
3. THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE REPORT: 2020 ANNUAL INSPECTION PINE POINT TAILINGS IMPOUNDMENT AREA, PINE POINT, NT, REFERENCE NO. 20140895-279-R-REV0-1000.

REFERENCES

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1:10,000 METRES

CLIENT
TECK METALS LTD.

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GOLDER

YYYY-MM-DD	2020-12-14
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REVIEWED	M. WILLAN
APPROVED	B. WICKLAND

PROJECT
PINE POINT TAILINGS IMPOUNDMENT AREA
2020 ANNUAL INSPECTION
PINE POINT, NT

TITLE
CROSS SECTION LOCATIONS

PROJECT NO.	PHASE/TASK/DOC.	REV.	FIGURE
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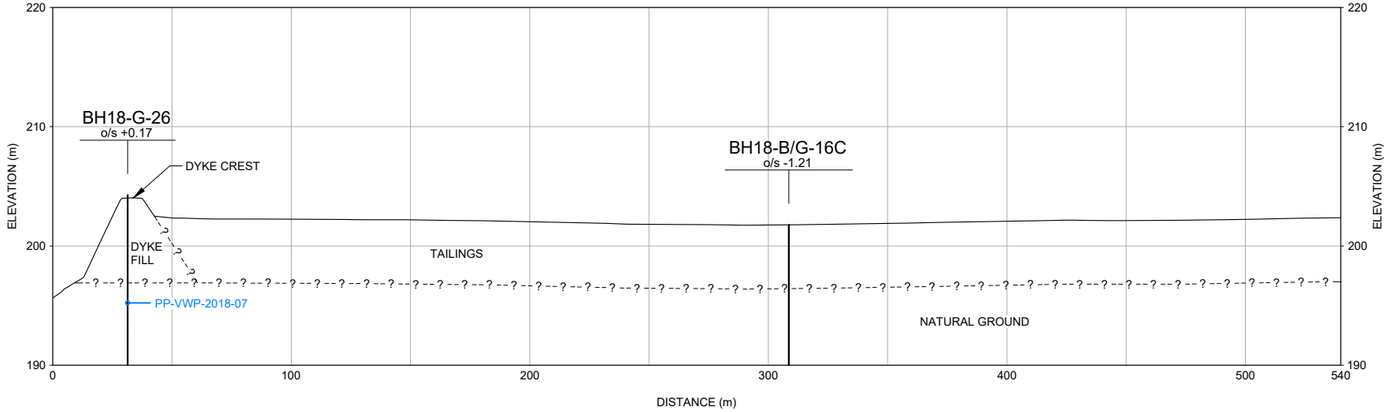

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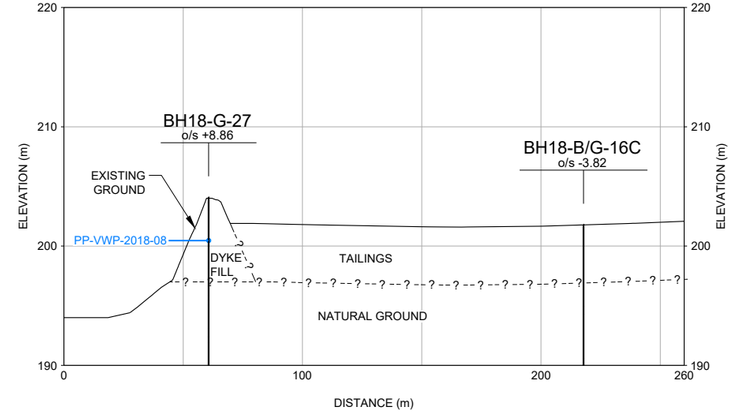

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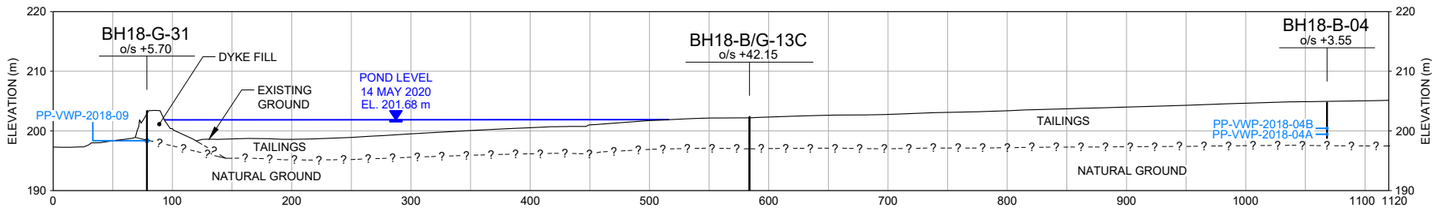
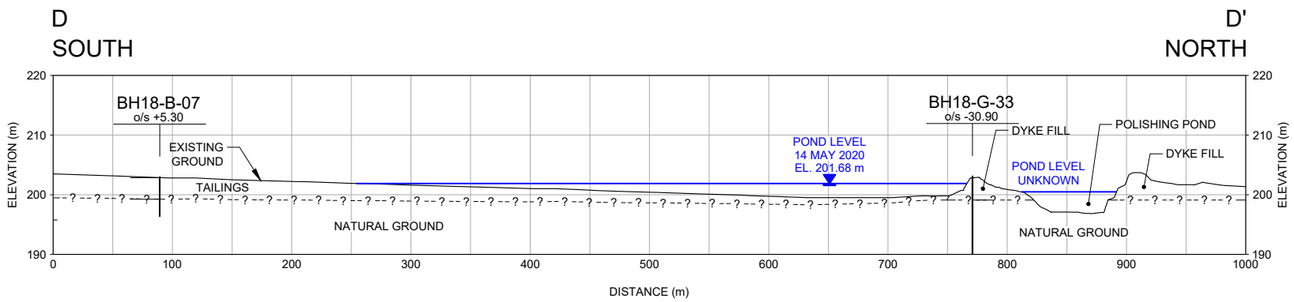


SCALE 1:5000 / VERTICAL SCALE 1:1000 — C/4 — CROSS SECTION C — 5X VERTICAL EXAGGERATION



SCALE 1:5000 / VERTICAL SCALE 1:1000 — D/4 — CROSS SECTION D — 5X VERTICAL EXAGGERATION

LEGEND

- EXISTING GROUND SURFACE (SEE REFERENCE 1)
- INFERRED STRATIGRAPHY
- WATER LEVEL
- PP-VWP-2018-07 TIP ELEVATION OF INSTRUMENT

NOTES

1. ALL UNITS IN METRES UNLESS OTHERWISE STATED.
2. ELEVATIONS SHOWN IN METRES, DATUM: NAVD83.
3. INDICATIVE STRATIGRAPHY IS BASED ON FIELD OBSERVATIONS FROM 2018 SITE INVESTIGATIONS.
4. THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE REPORT: 2020 ANNUAL INSPECTION PINE POINT TAILINGS IMPOUNDMENT AREA, PINE POINT, NT, REFERENCE NO. 20140895-279-R-REV0-1000.

REFERENCE

1. IMPOUNDMENT AREA TOPOGRAPHIC AND BATHYMETRIC SURVEY BY MASKWA ENGINEERING LTD., FILENAME: 18-034 Pine Point Tailings Topo Survey.dwg. SURVEY DATE 2019-06-26, ORIGINAL SCALE 1:15,000. RECEIVED 2019-08-12.

0 10 20
1:500 METRES

0 25 50
1:1,000 METRES

0 50 100
1:2,500 METRES

0 100 200
1:5,000 METRES

CLIENT
TECK METALS LTD.

PROJECT
PINE POINT TAILINGS IMPOUNDMENT AREA
2020 ANNUAL INSPECTION
PINE POINT, NT

TITLE
CROSS SECTIONS A TO D

CONSULTANT
GOLDER

YYYY-MM-DD	2020-12-14
DESIGNED	H. ROBERTS
PREPARED	A. WANG
REVIEWED	M. WILLAN
APPROVED	B. WICKLAND

PROJECT NO.	PHASE/TASK/DOC.	REV.	FIGURE
20140895	1000/1006/279	0	5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

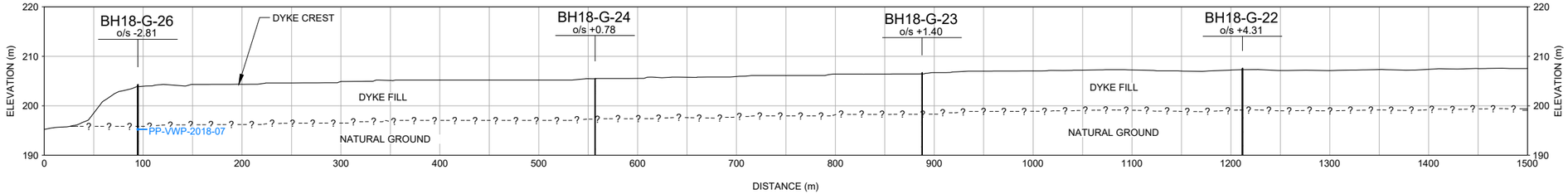
0 25 mm

E

NORTH

E'

SOUTH



SCALE 1:5000
VERTICAL SCALE 1:1000

E

4

CROSS SECTION E

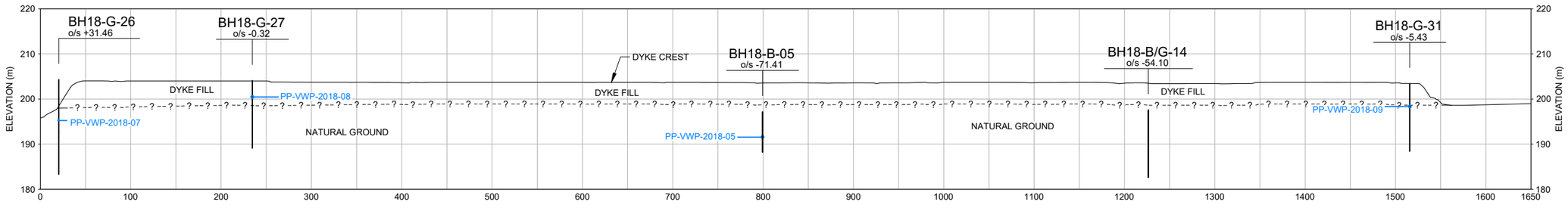
5X VERTICAL EXAGGERATION

F

WEST

F'

EAST



SCALE 1:5000
VERTICAL SCALE 1:1000

F

4

CROSS SECTION F

5X VERTICAL EXAGGERATION

0 25 50

1:1,000 METRES

0 100 200

1:5,000 METRES

LEGEND

- – – – – – – EXISTING GROUND SURFACE (SEE REF 1)
- – ? – – ? – – ? – – ? – INFERRED STRATIGRAPHY
- PP-VWP-2018-07 TIP ELEVATION OF INSTRUMENT

NOTES

1. ALL UNITS IN METRES UNLESS OTHERWISE STATED.
2. ELEVATIONS SHOWN IN METRES, DATUM: NAVD83.
3. INDICATIVE STRATIGRAPHY IS BASED ON FIELD INVESTIGATION COMPLETED IN 2018 AND THICKNESSES ARE MEASURED AS AVERAGES.
4. THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE REPORT: 2020 ANNUAL INSPECTION PINE POINT TAILINGS IMPOUNDMENT AREA, PINE POINT, NT, REFERENCE NO. 20140895-279-R-REV0-1000.

REFERENCE

1. IMPOUNDMENT AREA TOPOGRAPHIC AND BATHYMETRIC SURVEY BY MASKWA ENGINEERING LTD., FILENAME: 18-034 Pine Point Tailings Topo Survey.dwg. SURVEY DATE 2019-06-26, ORIGINAL SCALE 1:15,000. RECEIVED 2019-08-12.

CLIENT

TECK METALS LTD.

PROJECT

PINE POINT TAILINGS IMPOUNDMENT AREA
2020 ANNUAL INSPECTION
PINE POINT, NT

TITLE

CROSS SECTIONS E AND F

CONSULTANT

GOLDER

YYYY-MM-DD	2020-12-14
DESIGNED	H. ROBERTS
PREPARED	A. WANG
REVIEWED	M. WILLAN
APPROVED	B. WICKLAND

PROJECT NO.	PHASE/TASK/DOC.	REV.	FIGURE
20140895	1000/1006/279	0	6

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

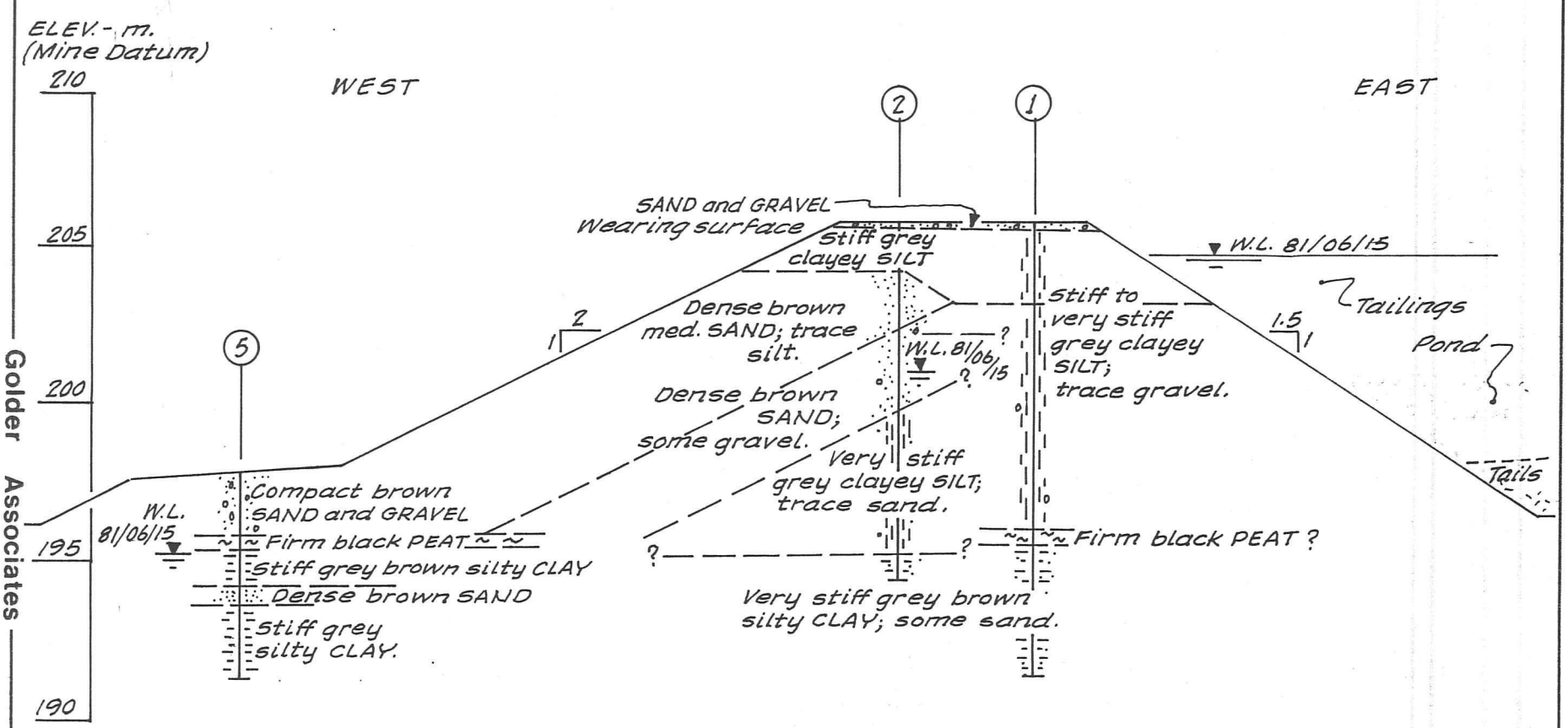
0 25 mm

APPENDIX A

Historical Cross-Sections

PROJECT NO. 812-1116 DRAWN ltg. REVIEWED JH DATE July '81

INFERRED STRATIGRAPHY Sta. 35+40 - WEST DYKE.



SECTION A-A
Station 35+40 - West Dyke

Scale: 1:200

LEGEND:

(5) Location of Borehole.

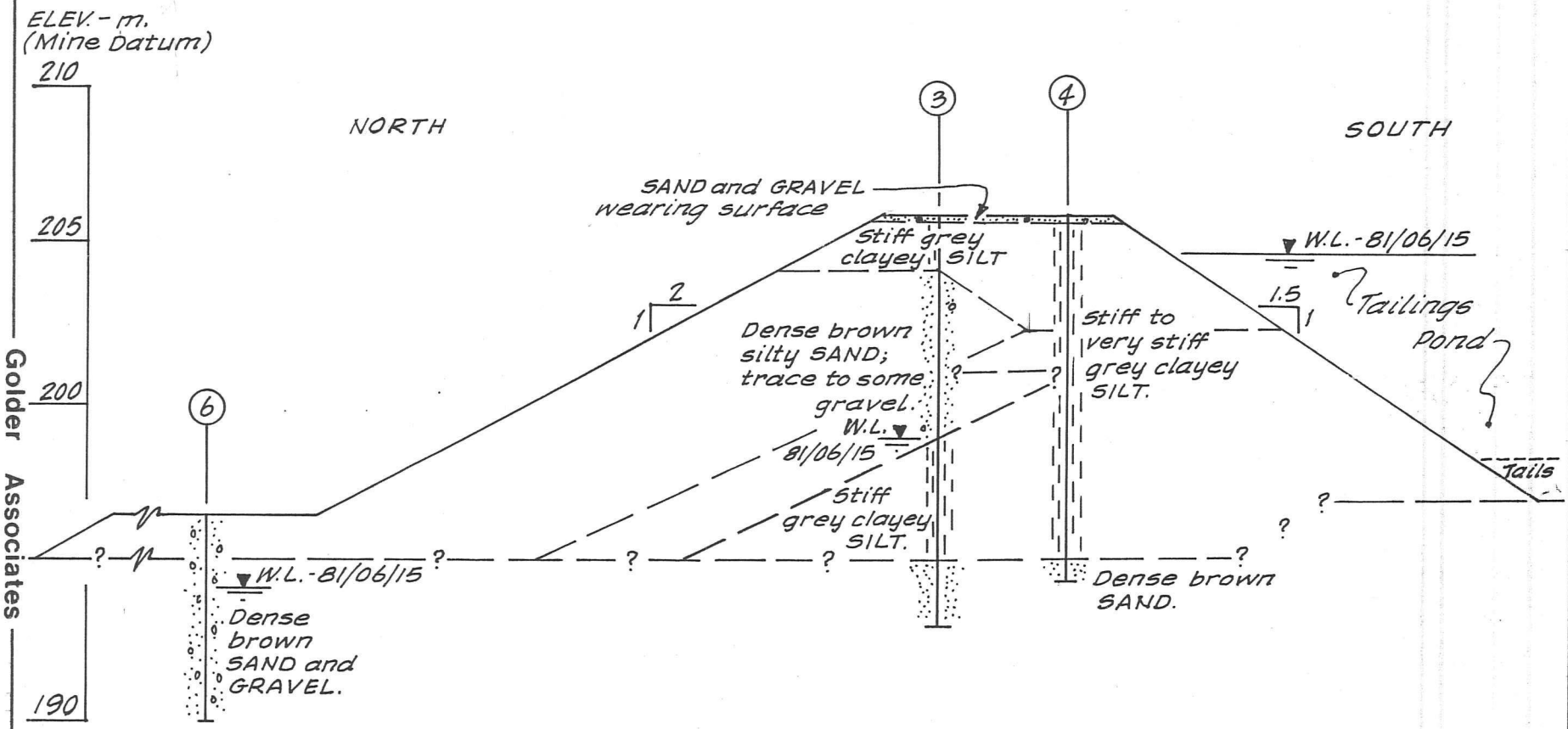
NOTES:

1. For location of Section, see Fig. 2.
2. Section partially inferred from construction records.
3. Black peat removed from under toe berm of west dyke south of Sta. 35+00.

Golder Associates

Figure 3

PROJECT NO. 812-1116 DRAWN hg REVIEWED [illegible] DATE July 1981



SECTION B-B
Station 36+50 - North Dyke

Scale: 1:200

LEGEND:
(6) Location of Borehole.

NOTES:
1) For location of Section, see Fig. 2.
2) Section partially inferred from construction records.

INFERRED STRATIGRAPHY
Sta. 36+50 - NORTH DYKE

Figure 4

Golder Associates

APPENDIX B

Facility Data Sheet

Facility Data Sheet
Physical Description

Pine Point Tailings Impoundment Area

Tailings Impoundment Area (including dykes)	~7,000,000 m^2
Quantity of Tailings	~50,000,000 to 60,000,000 t
Reservoir Capacity	930,000 m^3 (to maximum operating water level of 201.8 m)
Inflow Design Flood (IDF)	between 1/100- and 1/1,000-year return period (CDA 2013)
Design Earthquake	between 1/100- and 1/1,000-year return period (CDA 2013)
Spillway Capacity	Unknown
Catchment Area	9 km^2 (6 km^2 internal and 3 km^2 external)

South Dyke

Dam Type	Downstream raised earthfill dam
Maximum Dam Height	6 m
Dam Crest Width	5 m
Consequence Classification	Low (CDA 2013)
Access to Dam	From south and from southwest corner of facility

West Dyke

Dam Type	Downstream raised earthfill dam
Maximum Dam Height	9 m
Dam Crest Width	6 m
Consequence Classification	Significant (CDA 2013)
Access to Dam	From southwest corner of facility

North Dyke

Dam Type	Downstream raised earthfill dam
Maximum Dam Height	9 m
Dam Crest Width	8 m
Consequence Classification	Significant (CDA 2013)
Access to Dam	From northeast or northwest corner of facility

East Dyke

Dam Type	Downstream raised earthfill dam
Maximum Dam Height	2 m
Dam Crest Width	6.5 m
Consequence Classification	Low (CDA 2013)
Access to Dam	From northeast corner of facility

APPENDIX C

Main Pond Water Levels

Date	Water Elevation (m)	Comment
May-09	201.45	-
Oct-09	200.20	-
May-10	201.49	-
Jul-10	200.65	-
Oct-10	200.17	-
May-11	201.31	-
Jul-11	201.16	-
Oct-11	200.15	-
May-12	201.21	-
Aug-12	201.00	-
Oct-12	200.02	-
May-13	201.22	-
Jul-13	201.03	-
Oct-13	200.19	-
May-14	201.20	-
Jul-14	201.00	-
Oct-14	199.73	-
May-15	201.00	-
Oct-15	200.37	-
May-16	201.43	-
Oct-16	200.39	-
May-17	201.67	-
Jun-17	201.62	-
Jul-17	201.03	-
Oct-17	200.39	-
May-18	202.05	-
Jun-18	201.72	-
Jul-18	201.71	-
Aug-18	201.60	-
Oct-18	200.48	-
May-19	201.09	-
Aug-19[a]	200.69	1 August 2019 - Start of Water treatment 2019
Aug-19[b]	200.56	12 August 2019 – 2019 Site Visit
Aug-19[c]	200.37	30 August 2019 – End of Water Treatment 2019
Oct-19	200.39	-
May-20[d]	201.68	14 May 2020 – Highest recorded water level, during Maskwa routine spring inspection.
Jun-20	201.57	19 June 2020 – End of Daily Monitoring
July-20[e]	201.48	1 July 2020 – Start of water treatment 2020
Sept-20[f]	200.87	16 September 2020 – End of water treatment 2020
Sept-20[g]	200.92	22 September – Water level during 2020 annual inspection

APPENDIX D

Annual Inspection Trip Report

TECHNICAL MEMORANDUM

DATE 6 November 2020 **Reference No.** 20140895-277-TM-Rev0-2000

TO Michelle Unger, Site Manager
Teck Metals Ltd.

CC Kathleen Willman and Morgan Lypka

FROM Martyn Willan and Ben Wickland **EMAIL Martyn_Willan@golder.com; Ben_Wickland@golder.com**

2020 ANNUAL FACILITY INSPECTION TRIP REPORT, PINE POINT TAILINGS IMPOUNDMENT AREA, NT

1.0 SITE INSPECTION DETAILS

Date: 22 September 2020

Time: 10:15 am to 16:30 pm

Weather: sunny, partly cloudy, light wind, 15° Celsius

Attendees:

- Golder Associates Ltd. (Golder): Ben Wickland, P.Eng., Engineer of Record, and Martyn Willan, P.Eng., Geotechnical Engineer
- Teck Metals Ltd. (Teck): Morgan Lypka, P.Eng. (BC) Tailings and Water Retaining Structures Engineer
- Maskwa Engineering Ltd. (Maskwa): Clell Crook Jr., Representative of Tailings Surveillance Officer

Geotechnical investigations were in progress during the inspection.

Generally, where “an increase in rilling” is noted, the comment implies a change from conditions observed in the 2019 annual inspection compared to the 2020 annual inspection. While rill formation is a progressive process, the amount of change from 2019 to 2020 appears greater than year-to-year changes observed in recent inspections. Comparison of year-to-year changes is based on the number and distribution of new rills, as well as the depth, length and degree of weathering of pre-existing rills. A change in the degree of weathering was inferred where rills that were previously observed to have rounded edges and described as stable had progressed visibly, with steeper sides, increased depth and length and often with new accumulations of sediment at the dyke toe, indicating an increase in the volume of material loss.

1.1 South Dyke

East End

- No water in the impoundment area adjacent to the dyke.

- Vegetation on the upstream slope similar to previous years.
- Three rills on the upstream slope require maintenance (11 V 640,428 6,751,576).
  - Up to ~30 cm deep, ~1.3 m wide, and extending into the dyke crest by up to ~1.3 m.
- Minor rilling on upstream and downstream slopes up to ~20 cm deep and 80 cm wide.
  - Number of rills and depth of existing rills appeared to have increased compared to the 2019 inspection.
- Crest was in good condition with minor rutting from light vehicle traffic.
- Clear standing water in ditch on downstream side of dyke, larger area than observed in previous years, indicating recent precipitation. Impoundment side (upstream) was dry.

Central

- Crest was rutted and damaged by vehicle traffic between 2 ramps (11 V 639,542 6,751,162; repaired same day).
- Crest with minor rutting from light vehicle traffic in other locations.
- Minor rilling on the upstream and downstream slopes.
  - Number of rills and depth of existing rills appeared to have increased compared to the 2019 inspection.
  - Rills did not extend into the dyke crest.

West End

- Minor ponding on tailings cover in southwest impoundment area.
- Slopes were in good condition with minor rilling up to ~0.15 m depth.
  - Number of rills and depth of existing rills appeared to have increased compared to the 2019 inspection.
  - Rills did not extend into dyke crest.
- Crest was stepped/benched and in good condition with minor rutting from light vehicle traffic.
- Dyke crest narrow (~3 m) compared with dyke crest width in other areas of the facility.
- Vegetation had been cut and left in place on the downstream slope.
- Downstream toe area was wet, vegetated.

1.2 West Dyke

South End

- Minor ponding on tailings cover in southwest impoundment area.
- Minor cracking of tailings surface near dyke, with areas of exposed tailings.

- Sparse vegetation on the upstream and downstream dyke slopes.
- Minor rilling on upstream slopes up to ~30 cm deep.
- Minor to major rilling on downstream slope.
  - Rilling had increased from previous years with some rills joining on the lower slope (11 V 638,353 6,751,214).
  - Rills were confined to the lower slope, which steps out. Rills did not extend into the dyke crest.
  - Local rills approaching 30 cm depth.
  - Fines accumulating locally at toe below rills.
- Crest was in good condition with minor rutting from light vehicle traffic.
- Clear standing water in ponds on downstream side of dyke, larger area than observed in previous years.

Central

- No water in impoundment area adjacent to the dyke.
- Minor rills on upstream slope up to ~25 cm deep.
- Zone of rilling on downstream slope over ~350 m (11 V 638,323 6,751,622 to 638,305 6,751,990).
  - Rilling had increased since the 2019 inspection with some rills joining on the lower slope.
  - Rill development was confined to the lower slope, which steps out. Rills did not extend into the dyke crest.
  - Two local rills had relatively unweathered edges, indicating recent erosion:
    - 0.4 m deep, 1.7 m wide
    - 0.5 m deep, 1.7 m wide
  - Fines accumulating locally at toe below rills.
  - Rills should continue to be monitored as part of routine inspections.
- Crest was in good condition with minor rutting from light vehicle traffic.
- Minor vegetation on downstream slope.

North End

- No water in impoundment area adjacent to the dyke.
- Dyke was in good condition with rilling on upstream and downstream slopes up to ~25 cm deep.
  - Number of rills and depth of existing rills appeared to have increased compared to the 2019 inspection.

- Rills did not extend into the dyke crest.

- Crest was in good condition with minor rutting from light vehicle traffic.
- Downstream toe area was generally dry, with locally soft, moist to wet ground.
  - Red staining and salts observed along a drainage channel running towards the pond in a borrow area, consistent with previous observations.
  - Rainbow staining was observed on the surface of the water which cracked and fragmented when disturbed, consistent with previous observations.
  - Flowing water was observed running along the downstream dyke toe, to the pond to the west.

1.3 North Dyke

West End

- No water in impoundment area adjacent to the west end of the dyke.
- One rill on downstream slope requires maintenance, approximately 25 m from the north west corner of the dyke (11 V 638,317 6,753,169).
  - ~80 cm deep and ~1.0 m wide.
- Dyke was otherwise generally in good condition with rilling on upstream and downstream slopes up to ~30 cm deep.
  - Number of rills and depth of existing rills appeared to have increased compared to the 2019 inspection.
  - Rills did not extend into the dyke crest.
- Minor vegetation on upstream and downstream slopes.
- Rutting of crest, 7 to 20 cm depth over ~30 m length (11 V 638,342 6,753,176).
- Locations of 2018 rill repairs on downstream slope were in good condition.
- Water ponded in a borrow pit in the downstream toe area was clear with no visible movement or evidence of seepage or sediment accumulation.

Central

- Pond in impoundment against north dyke, with 2.5 m freeboard to the crest. The pond was larger than observed in previous years.
- Woody debris (tree trunks) against the upstream slope.
- Repairs to erosion on the upstream slope, over 700 m section west of dogleg, were in good condition and generally stable with some exposed geotextile and with continuous riprap. A previously observed step in the slope was submerged, not visible during the inspection.

- A 30 cm high scarp in the upstream slope with exposed core was observed around the dogleg.
  - The scarp was noted in 2018 and was not repaired as the area was within the turn of the dam, where the dam section is wider and was vegetated, indicating stable conditions.
  - The area has generally undersized riprap and has been relatively stable.
  - The area should continue to be monitored as part of routine inspections.
- Crest was in good condition with minor rutting from light vehicle traffic.
- Dyke was in good condition with minor rilling on downstream slope up to ~20 cm deep.
  - Rilling had increased from previous years.
  - Rills did not extend into the dyke crest.
- Vegetation including sapling trees and rosehip bushes on the upstream and downstream slopes, and near the crest.
- Seep <1 L/minute at downstream toe near turn in dogleg, with red staining, clear of sediment, (11 V 639,949 6,753,696).

East End

- One rill on the upstream slope had cut into the crest and requires maintenance (11 V 640,451 6,753,933).
- Downstream slopes were otherwise in good condition with minor rilling.
- The impoundment water level was at an elevation of 200.922 m, calculated based on a reading of 0.890 m at the staff gauge at the culvert through the polishing pond dyke (Photograph 25), which was 0.11 m below the datum of elevation 201.032 m.
- Spillway 1 – from main pond through north dyke.
  - Soil in spillway inlet area, below the spillway invert.
  - Small pond downstream of spillway with vegetation in outlet area.
  - The concrete of the spillway was generally in good condition with some minor spalling, similar to previous inspections.
- The dyke upstream slope and crest were in good condition with minor rilling.
- Vegetation including sapling trees and rosehip bushes on the upstream and downstream slopes near the crest.
- At the east end of the north dyke the downstream toe area was generally higher than the impoundment side.
- Sludge and soil from water treatment was stacked in the impoundment area to an elevation higher than the dyke crest.
- Water pond between serpentine pond and sludge area was at a higher elevation than the main impoundment.

Polishing Pond

- The culvert between the main and polishing pond was closed. The water level in the polishing pond was below the culvert.
- Spillway 2 – from polishing pond through north dyke.
  - Syphons were in place in the spillway with no discharge of water at the time of the inspection.
  - Ponded water downstream of the spillway.
  - No seepage was noted from soils around the spillway downstream end, where seepage had been noted in the past.
  - Channel downstream of the spillway was in good condition, with less vegetation than Spillway 1.
  - Concrete in good condition.
  - Spillway was clear of debris.
- Polishing pond dyke slopes were in good condition with minor rilling and no evidence of seepage.

1.4 East Dyke

- Tailings were impounded against the north end of the east dyke, in an area that had been cleared of vegetation. Ponded water was present away from the upstream slope of the dyke.
- The dyke was in good condition with some minor rills up to ~15 cm deep on upstream and downstream slopes.
- The crest, upstream and downstream slopes had vegetation.
- The downstream area was dry.

2.0 RECOMMENDATIONS

Two new recommendations are made based on the inspection, presented in Table 1.

Maintenance of the larger areas on the west dyke downstream slope, where erosion was noted in 2020, and upgrade of the poorly armoured section of the upstream face of the north dyke, around the dogleg, should be considered. Maintenance may be required in the next few years and should be continued to be monitored in the interim.

Previous recommendations are presented in the annual inspection report.

Table 1: Recommendations from 2020 Annual Inspection

Structure	ID Number	Deficiency or Non-conformance	Applicable Regulation or OMS Manual Reference	Recommended Action	Priority	Recommended Deadline/Status as of 29 September 2020
TIA	2020-01	Erosion rills require maintenance.	5.5 and 5.6 of OMS	The following erosion rills require maintenance: ■ south dyke - 3 rills on upstream slope at east end ■ north dyke – 1 rill on the downstream slope approximately 25 m east of the north west corner north dyke – 1 rill on the upstream slope east of the polishing pond	4	Closed Maintenance completed September 2020.
TIA	2020-02	Pond water at 200.92 m, which is higher than historic levels following water treatment, with reduced storage capacity for the 2021 freshet.	1.0 of Water Treatment Manual	Prepare to manage high pond levels from 2021 freshet. Monitor snowpack, pond level, and climate forecast in advance of the 2021 freshet. Complete spring inspection immediately after 2021 freshet.	2	Q2 2021 (freshet).

Priority[a]	Description
1	High probability or dam safety issue considered immediately dangerous to life, health or the environment, or a significant risk of regulatory enforcement.
2	If not corrected/implemented could likely result in dam safety issues leading to injury, environmental impact or significant regulatory enforcement; or, a repetitive deficiency that demonstrates a systematic breakdown of procedures.
3	Single occurrences of deficiencies or non-conformances that alone would not be expected to result in dam safety issues.
4	Best Management Practice – Further improvements are necessary to meet industry best practices or reduce potential risks.

a) Source: Teck 2019.

ID = identification; OMS = operation, maintenance, and surveillance (Teck 2020b); MEPR = Mine Emergency Response Plan (Teck 2020a).

3.0 CLOSURE

This document is to be read with the Study Limitations section which follows the text and forms an integral part of this document.

We trust the above meets your present requirements. If you have any questions or would like to discuss, please contact the undersigned.

Golder Associates Ltd.

REGISTERED PROFESSIONAL ENGINEER
6 Nov 2020
B.E. WICKLAND
LICENSEE
NWT/NU

Martyn Willan, M.Sc., P.Eng.
Geotechnical Engineer

Ben Wickland, Ph.D., P.Eng.
Principal, Senior Geotechnical Engineer

MBW/BEW/et/hg

Attachments: Study Limitations
Attachment 1: 2020 Inspection Photographs
Attachment 2: Dam Inspection Form

https://golderassociates.sharepoint.com/sites/124507/project files/6 deliverables/issued/277-tm-rev0-2000-dsi visit summary/20140895-277-tm-rev0-2000-annual inspection trip report 06nov_20.docx

PERMIT TO PRACTICE
GOLDER ASSOCIATES LTD.
Signature
Date Nov 6/2020
PERMIT NUMBER: P 049
NT/NU Association of Professional Engineers and Geoscientists

REFERENCES

Golder (Golder Associates Ltd). 2019. 2019 *Dam Safety Inspection Pine Point Tailings Impoundment Area, Pine Point, NT*. 18114183-209-R-Rev0-3000. 8 November 2019.

Teck (Teck Resources Ltd.) 2019. *Guideline for Tailings and Water Retaining Structures*. March 2019.

Teck. 2020a. *Pine Point Emergency Response Plan.* SP&P: PP-ERP-002.V002. 31 March 2020.

Teck. 2020b. *Operation, Maintenance and Surveillance Manual for Pine Point Tailings Impoundment Area.* SP&P: PP-OMS-V001.V005. 1 May 2020.

STUDY LIMITATIONS

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ATTACHMENT 1

2020 Inspection Photographs

Photograph 1: South Dyke - East End – Dam Crest and Downstream Slope and Toe Area, Looking West, 22 September 2020

Photograph 2: South Dyke - East End – Erosion Rills on Upstream Slope, Looking Northeast, 22 September 2020

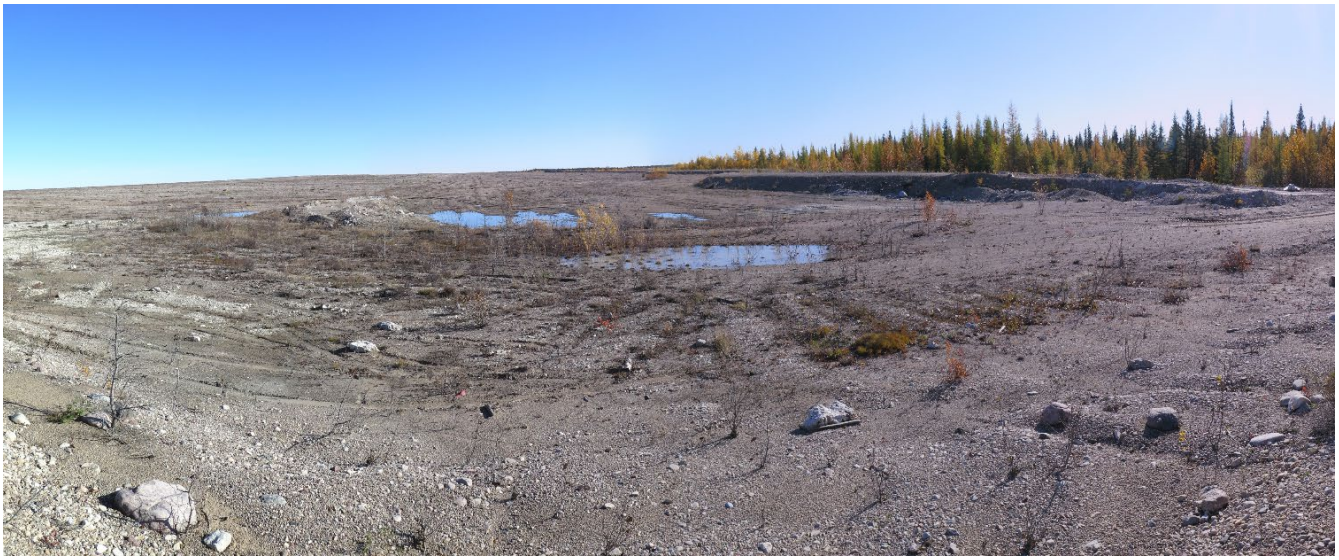
Photograph 3: South Dyke - Central Portion – Upstream Slope and Crest, and Debris in Impoundment Area, Looking East, 22 September 2020

Photograph 4: South Dyke – Central Portion - Damage to Crest and Upstream Slope, Looking East, 22 September 2020 (Repaired same day)

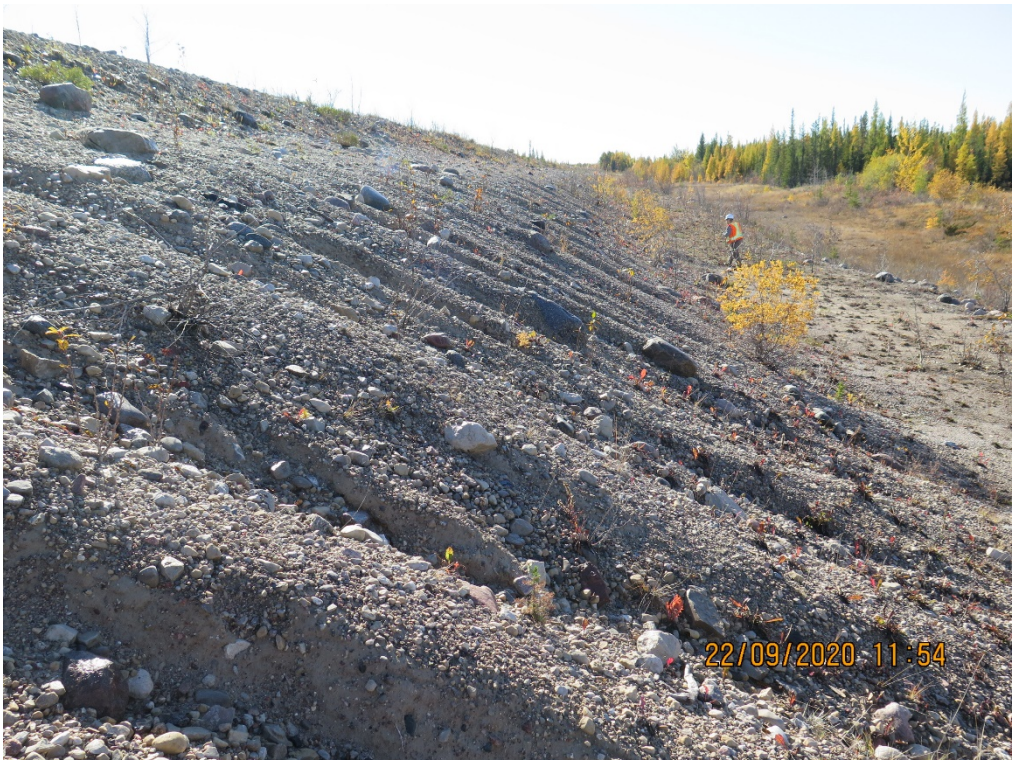
Photograph 5: South Dyke –West End - Crest with Vegetation on Downstream Slope, Looking West, 22 September 2020

Photograph 6: South Dyke – West End - Downstream Slope Cleared of Vegetation and Toe Area with Wet Ground, Looking Southwest, 22 September 2020

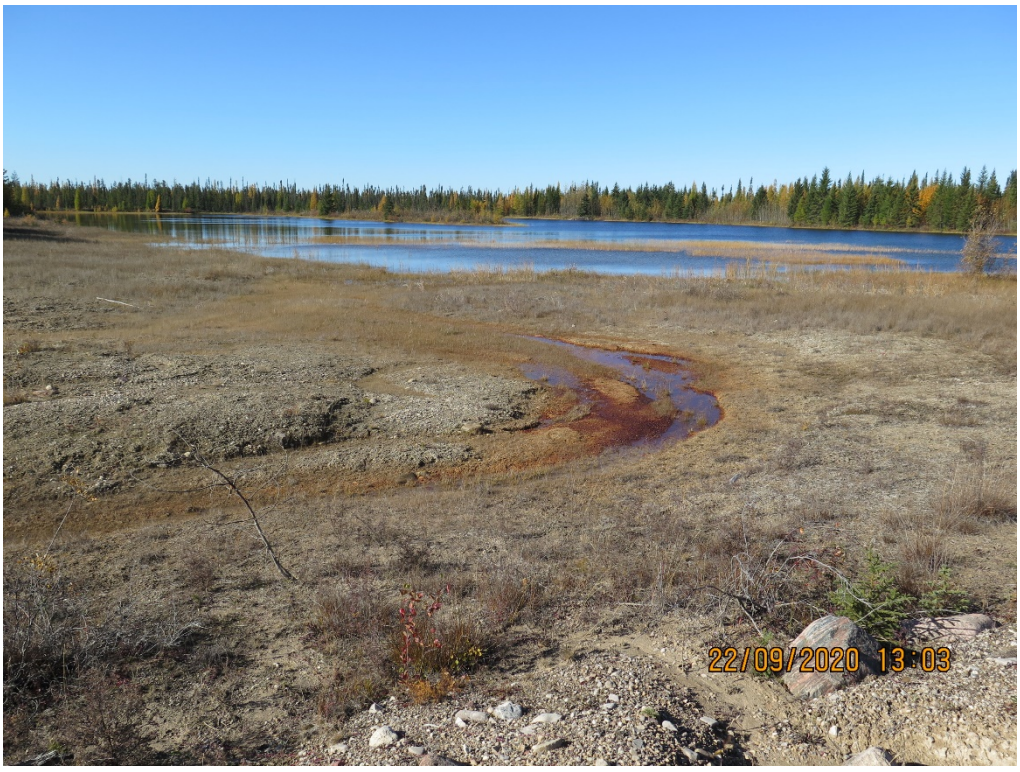
Photograph 7: West Dyke – South End – Crest, Upstream Slope and Toe Area, Looking North, 22 September 2020



Photograph 8: West Dyke – South End - Ponding in Impoundment, Looking Southeast, 22 September 2020



Photograph 9: West Dyke – Central Area - Downstream Slope with Erosion Rills, Looking South 22 September 2020



Photograph 10: West Dyke – North End - Downstream Toe Area with Staining Along Drainage, Looking West, 22 September 2020

Photograph 11: West Dyke – North End - Downstream Slope with Erosion Rills, Looking East, 22 September 2020

Photograph 12: North Dyke – West End - Downstream Slope, Looking East, 22 September 2020

Photograph 13: North Dyke – West End - Erosion Rills on Downstream Slope, Looking South, 22 September 2020

Photograph 14: North Dyke – West End - Erosion Rill on Downstream Slope, Detail, 22 September 2020

Photograph 15: North Dyke – West End – Crest, Looking Northeast, 22 September 2020

Photograph 16: North Dyke – Central Portion - Downstream Slope with Erosion Rills, Looking South, 22 September 2020

Photograph 17: North Dyke – Upstream Slope, Repaired with Riprap, Looking East, 22 September 2020

Photograph 18: North Dyke – Upstream Slope of Dogleg, Looking East, 22 September 2020

Photograph 19: North Dyke – Upstream Slope West of Dogleg, ~0.3 m Scarp with Exposed Core, Looking Northeast, 22 September 2020

Photograph 20: North Dyke – Downstream Toe Area at Dogleg, Seep and Red Staining, Looking East, 22 September 2020

Photograph 21: Main Pond Spillway (Spillway No. 1) – Inlet, Looking Southwest, 22 September 2020

Photograph 22: Main Pond Spillway (Spillway No. 1) – Outlet, Looking Southeast, 22 September 2020

Photograph 23: Polishing Pond Spillway (Spillway No. 2) – Outlet, Syphons in Place, Looking East, 22 September 2020

Photograph 24: Polishing Pond – Crest and Slope of Dyke (Polishing Pond on left), Looking East, 22 September 2020

Photograph 25: Main Pond Water Level Gauge at Culvert Intake to Polishing Pond, 22 September 2020

Photograph 26: North Dyke – Impoundment from Polishing Pond, looking East, 22 September 2020

Photograph 27: North Dyke – East End - Upstream Slope with Erosion Rill, looking South, 22 September 2020

Photograph 28: East Dyke – Crest and Upstream Slope with Ponded Water, looking South, 22 September 2020

ATTACHMENT 2

Dam Inspection Form

Tailings Impoundment Inspection Form
Pine Point Tailings Impoundment

Date: 22 September 2020	Inspected By: Ben Wickland
Weather: Sunny, partly cloudy with light wind, 15ºC	
Tailings Pond Information:	
Pond Elevation: 200.922 m	Operating Limits: Alert Water Level: 201.6 m Maximum Operating Water Level: 201.8 m
Minimum Crest Elevation: 203.5 m	Freeboard: 2.5 m

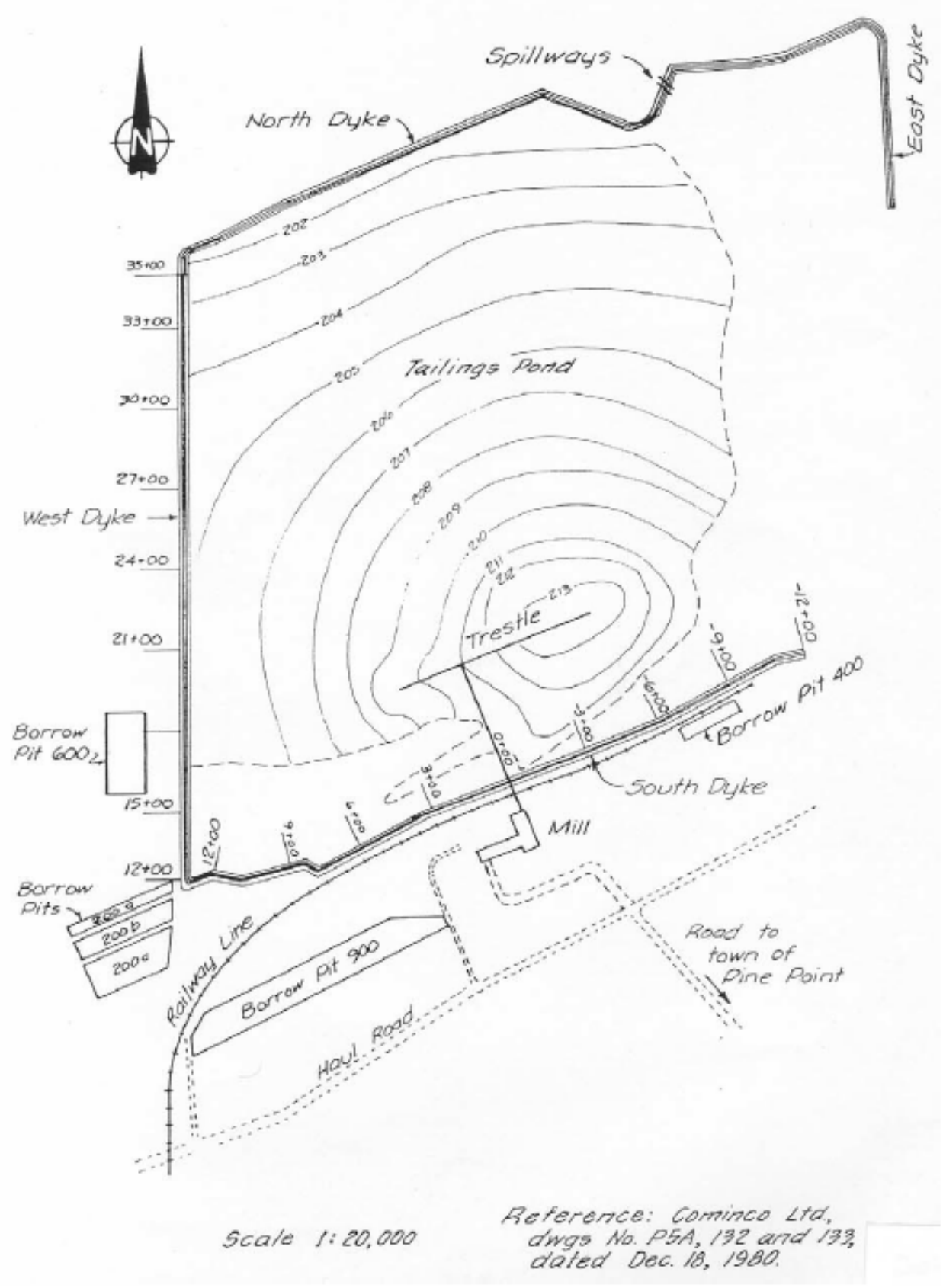
Dyke Inspection Check List (☑=checked; x=not checked)

Check: Upstream Slope of Dyke, Crest and Downstream Slope of Dyke

South Dyke	**Checked**	**Comment**
Ponded Water	☑	Ponded water upstream of dyke at west end – away from dyke Ponded water downstream of dyke at west and east ends
Erosion	☑	Minor rilling on upstream and downstream slopes up to 20 cm deep Three rills at east end approx. 30 cm deep and cutting into dam crest require maintenance, 11 V 640,428 6,751,576)
Settlement/Depressions	☑	Minor rutting on crest from light vehicle traffic Rutting on upstream slope and crest at central portion – repaired same day. Dam crest is benched/stepped at west end
Sinkholes	☑	None
Cracks/Movement	☑	None observed
Debris	☑	Debris in impoundment area
Vegetation	☑	Vegetation at east end cleared from downstream slope
Other -(photos)	N/A	Photographs – 1 to 6 (Attachment 1)
Notes:		Rutting on upstream slope and crest at central portion repaired 22 September 2020, PM
West Dyke		
Ponded Water	☑	Ponded water upstream of dyke at south west corner Downstream of dyke standing water at south, central and north areas (staining along drainage course at north end)
Erosion	☑	Rilling on upstream slopes < 30 cm deep Rilling >30 cm over 350 m (11 V 638,323 6,751,622 to 638,305 6,751,990) length of the lower downstream below step in slope. Rills did not extend into dam crest.
Settlement/Depressions	☑	Sloughing/slumping, up to 50 cm deep associated with rilling on lower toe with accumulation of fines at toe
Sinkholes	☑	None
Cracks/Movement	☑	None
Debris	☑	Trees/branches on pond side at north end.

Vegetation	☑	Minor vegetation on upstream and downstream slopes
Other -(photos)	N/A	Photographs 7 to 11 (Attachment 1)
Notes:		Erosion on upstream slope with dried grout near borehole drilled in 2020. No grout observed on downstream slope.
North Dyke		
Ponded Water	☑	Freeboard approximately 2.0 to 2.5 m Pond water level higher than in previous inspections Ponded water north of dyke in downstream toe area Ponded water upstream area of north dyke in area east of polishing pond
Erosion	☑	Rilling on upstream and downstream slopes up to 30 cm deep. Rills requiring repair: - 25 m from northwest corner, downstream slope, 80 cm depth (11 V 638,317 6,753,169) - East of polishing pond, cutting into crest, upstream side requires repair (11 V 640,451 6,753,933) Location of rill repairs in 2018 in good condition. Riprap placed on upstream slope of dam in good condition, some exposed geotextile. Minor deformation and stepping in lower upstream slope toe around dogleg with a scarp of up to 30 cm and exposed till core, similar to previous inspection. Minor rilling on upstream side of polishing dyke Erosion rill on upstream slope of north dyke, east of polishing pond, requires maintenance for vehicle safety
Settlement/Depressions	☑	Minor rutting on crest from light vehicle traffic With 20 cm depth over ~30 m length at west end
Sinkholes	☑	None
Cracks/Movement	☑	None
Debris	☑	Trees/branches in pond at west end
Vegetation	☑	Vegetation on the downstream and upstream slopes up to the crest including some small conifer trees
Main Pond Spillway	☑	In good condition Some minor ponding downstream of outlet
Treatment Spillway	☑	Siphons in place and closed. In good condition.
Other -(photos)	N/A	Photographs 12 to 27 (Attachment 1)
Notes:		Seep with red staining in area downstream of dogleg, < 1 L/min, no fines observed, 11 V 639,949 6,753,696

East Dyke		
Ponded Water	☑	Tailings and ponded water upstream of dyke in non-vegetated area
Erosion	☑	Minor rilling on upstream and downstream slopes up to 10 cm deep
Settlement/Depressions	☑	None
Sinkholes	☑	None
Cracks/Movement	☑	None
Debris	☑	None
Vegetation	☑	On upstream and downstream slopes
Other -(photos)	N/A	Photograph 28 (Attachment 1)
Notes:		None


Spillways
East Dyke
North Dyke
N
202
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205
Tailings Pond
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212
213
35+00
33+00
30+00
27+00
West Dyke
24+00
21+00
Trestle
-12+00
-9+00
-6+00
-3+00
0+00
3+40
6+00
9+00
12+00
15+00
Borrow Pit 600
Borrow Pit 400
South Dyke
Mill
Borrow Pits
200a
200b
200c
Railway Line
Borrow Pit 900
Haul Road
Road to town of Pine Point
Scale 1:20,000
Reference: Cominco Ltd, dwgs No. P5A, 132 and 133, dated Dec. 18, 1980.

Tailings Impoundment Inspection
Explanation of Details

Ponded Water:

Look for pools of water against the inside or outside slopes of the Dyke structure. The pooled water is a potential source of water to erode the dyke and therefore the presence of any water must be recorded. Ideally the GPS location should be noted in the comments area.

Another aspect of pooled water is that it may be a source of seepage water at the outside toe of the dyke therefore where pooled water is observed look for increased seepage at the toe. The presence of water at the dyke face can be an indication of increased water levels within the dyke which can decrease Dyke stability.

Erosion:

The presence of small rills, up to 0.3m deep, on the downstream face of the dyke are normal and of no concern. If the rills start eroding into channels greater than 0.3 m and are cutting into the crest more than 0.5 m then the rills must be filled to prevent further progress.

Erosion can also be caused by wave action on the pooled water. Erosion has been occurring on the inside slope of the North Dyke and will soon require placement of material to armor the dyke face. Erosion into the till core must be prevented therefore any excessive erosion must be reported. Ideally record the GPS location so the area can be found on future inspections.

Settlement/Depressions:

Settlement or depressions in the crest or slopes indicate groundwater erosion of the interior of the dyke. Look for any visible seepage at the toe of the dyke. This is a very serious problem and it must be investigated by a professional.

Ideally record the GPS location so the depression can be easily found.

Sinkholes:

Sinkholes are localized deep depressions and are another indication of interior erosion of the dyke. This is a very serious problem and it must be investigated by a professional.

Ideally record the GPS location so the depression can be easily found.

Cracks/Movement:

Cracks accompanied by movement are an indication of a dyke failure and material would probably be seen flowing from the toe of the dyke. This is a very serious situation which must be reported immediately and be investigated by a professional. Ideally record the GPS location so the area can be easily found.

Debris:

Accumulation of debris on the dyke can prevent inspection of the dyke and should be removed.

Vegetation:

Small vegetation on the slopes of the dykes is good to minimize surface erosion. Larger vegetation hinders inspections of the dyke and can damage the dyke if root systems penetrate the till core or large root systems are ripped out by the wind. See OMS manual for requirement for treatment and removal of vegetation.

Photos:

A log of photos should be maintained.

Locations of key photos should be noted so future photos are taken from the same spot of area looking at the same feature.

APPENDIX E

Vibrating Wire Piezometer Data

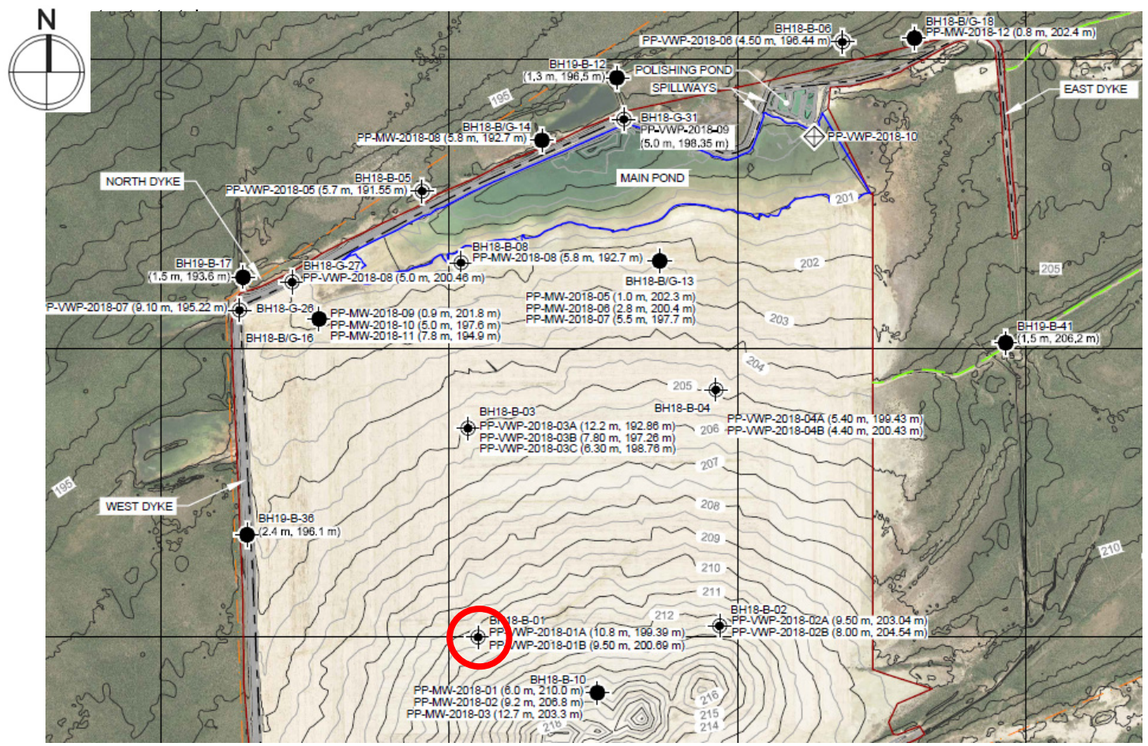
Interpretation of Vibrating Wire Piezometer Data for 2019/2020 Monitoring Period

- **PP-VWP-2018-01A - Tailings impoundment**
  - Data missing from 23 December 2019 to 8 January 2020.
  - Data missing from 10 January to 28 March 2020.
  - Data in the 2019/2020 monitoring period were consistent with data trends from the 2018/2019 monitoring period.
  - Instrument appears to be functioning properly.
- **PP-VWP-2018-01B - Tailings impoundment**
  - Data missing from 23 December 2019 to 8 January 2020.
  - Data missing from 10 January to 28 March 2020.
  - Pressure increase from approximately 35 to 44 kPa occurred within 3 days in September 2019.
    - The change implies an increase in water elevation of approximately 1 m and is not considered to reflect a change in performance
  - Instrument to be checked for functionality / calibration
- **PP-VWP-2018-02A - Tailings impoundment**
  - Data missing 11 December 2019 to 24 March 2020.
  - Data in the 2019/2020 monitoring period were consistent with data trends from the 2018/2019 monitoring period.
  - Pressure increase from approximately 30 to 80 kPa occurred within 2 days in September 2020.
    - The change implies an increase in water elevation of approximately 4 m and is not considered to reflect a change in performance
  - Instrument to be checked for functionality / calibration.
- **PP-VWP-2018-02B - Tailings impoundment**
  - Data missing 11 December 2019 to 24 March 2020.
  - Pressure decrease from approximately 53 to 4 kPa occurred within 4 days in September 2019.
    - The change implies a decrease in water elevation of approximately 5 m and is not considered to reflect a change in performance
  - Instrument to be checked for functionality / calibration.

- **PP-VWP-2018-03A – Tailings impoundment**
  - Data missing 15 December 2019 to 24 March 2020.
  - Data in the 2019/2020 monitoring period were consistent with trends from the 2018/2019 monitoring period.
    - Pressures increased from June 2020 to the end of the monitoring period.
  - Instrument appears to be functioning properly.
- **PP-VWP-2018-03B – Tailings impoundment**
  - Data missing 15 December 2019 to 24 March 2020.
  - Data in the 2019/2020 monitoring period were consistent with trends from the 2018/2019 monitoring period.
    - Pressures increased from June 2020 to the end of the monitoring period.
  - Instrument appears to be functioning properly.
- **PP-VWP-2018-03C – Tailings impoundment**
  - Data missing 15 December 2019 to 24 March 2020.
  - Data in the 2019/2020 monitoring period were consistent with trends from the 2018/2019 monitoring period.
    - Pressures increased from June 2020 to the end of the monitoring period.
  - Instrument appears to be functioning properly.
- **PP-VWP-2018-04A – Tailings impoundment**
  - Data missing 9 December 2019 to 24 March 2020.
  - Data in the 2019/2020 monitoring period were consistent with trends from the 2018/2019 monitoring period.
    - Pressures increased from June 2020 to the end of the monitoring period.
  - Instrument appears to be functioning properly.
- **PP-VWP-2018-04B – Tailings impoundment**
  - Data missing 9 December 2019 to 24 March 2020.
  - Data in the 2019/2020 monitoring period were consistent with trends from the 2018/2019 monitoring period.
    - Pressures increased from June 2020 to the end of the monitoring period.
  - Instrument appears to be functioning properly.

- **PP-VWP-2018-05 – Downstream of north dyke**
  - Instrument was installed in 2018 and connected to the remote monitoring system in July 2020.
  - Data available from 9 July 2020 to 30 September 2020.
  - Data is being transmitted to GeoExplorer.
  - Reporting and interpretation of baseline data was in progress at the time of this report.
  - Data for water level indicates pressures outside expected range.
    - Instrument to be checked for calibration.
- **PP-VWP-2018-06 – Downstream of polishing pond**
  - Data missing 2 June to 30 August 2020.
  - Data in the 2019/2020 monitoring period were consistent with trends from the 2018/2019 monitoring period.
  - Instrument appears to be functioning properly.
- **PP-VWP-2018-07 – Northwest corner of TIA**
  - Data missing 13 January to 24 March 2020.
  - Negative pressures have been recorded since the instrument was installed, indicating the piezometer tip is dry.
  - Instrument appears to be functioning properly.
- **PP-VWP-2018-08 – North dyke**
  - Data missing 2 August 2019 to 25 June 2020.
  - Negative pressures have been recorded since the instrument was installed, indicating the piezometer tip is dry.
  - Temperature readings are inconsistent with readings in other instruments at the Pine Point TIA, and are not considered to be representative of field conditions.
  - Instrument to be checked for functionality / calibration.
- **PP-VWP-2018-09 – North dyke**
  - Data missing 12 August to 3 December 2019.
  - Data missing 5 Dec 2019 to 24 March 2020.
  - Temperature readings indicate a sensor malfunction.
  - Instrument to be checked for functionality / calibration.

- **PP-VWP-2018-10 – Main pond at polishing pond dyke**
  - Data missing 7 December 2019 to 24 March 2020.
  - Data in the 2019/2020 monitoring period were consistent with data trends from the 2018/2019 monitoring period.



INVESTIGATION NAMING CONVENTION

BH18-B/G-01

- BH - BOREHOLE
- TYPE
- YEAR
- CONSULTANT: B - BARR; G - GOLDER; B/G - BARR AND GOLDER

PIEZOMETER INSTALL
PP-VWP-2018-02A (8.00 m, 10 m)

- PINE POINT
- YEAR
- NUMBER
- (DEPTH OF TIP m, ELEVATION OF TIP m)
- VIBRATING WIRE PIEZOMETER

MONITORING WELL INSTALL
PP-MW-2018-02A (9.22 m, 16 m)

- PINE POINT
- YEAR
- NUMBER
- (DEPTH TO TOP OF SCREEN m, ELEVATION OF TOP OF SCREEN m)
- MONITORING WELL

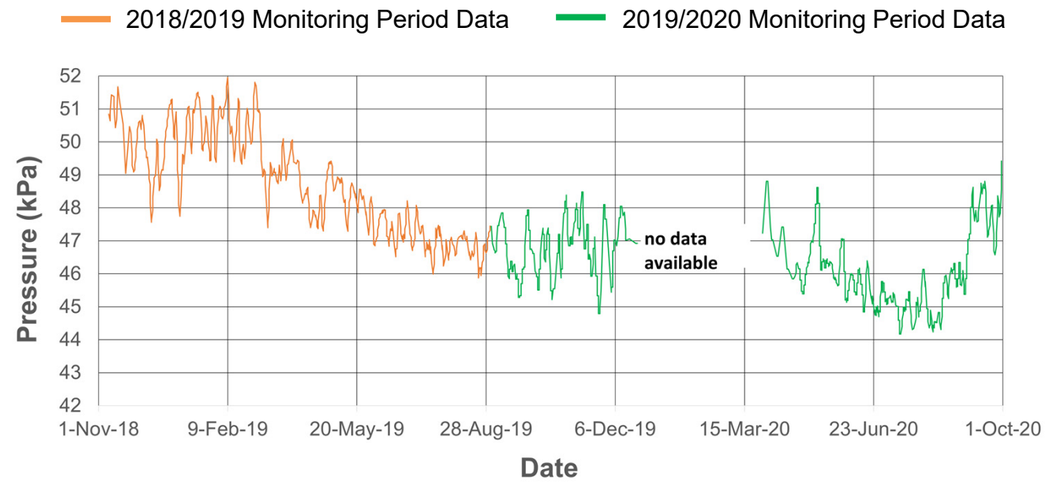
LEGEND

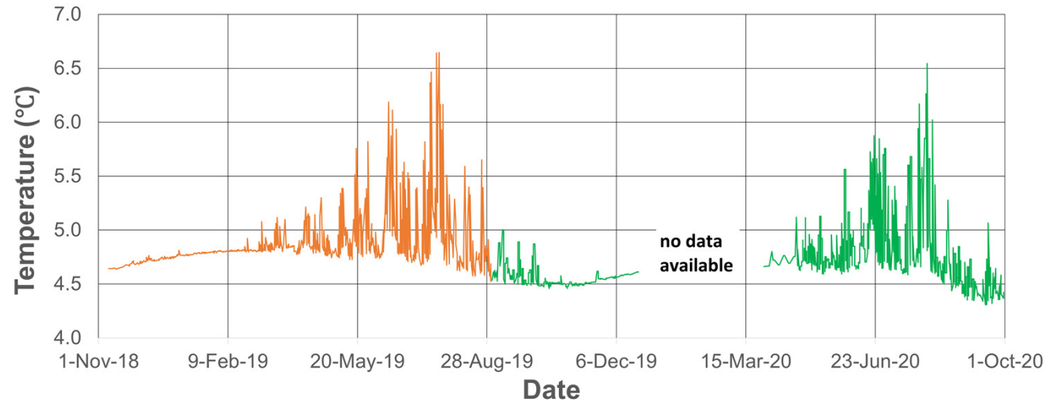
- BOREHOLE
- BOREHOLE WITH NESTED WELL
- BOREHOLE WITH PIEZOMETER
- MAIN POND PIEZOMETER
- APPROXIMATE DYKE CRESTS
- APPROXIMATE SURFACE LEASE BOUNDARY (SEE REFERENCE 1)
- EXTENT OF MAIN POND (SEE REFERENCE 2)
- MAJOR TOPOGRAPHIC CONTOUR (INTERVAL = 1 m)
- MINOR TOPOGRAPHIC CONTOUR (INTERVAL = 0.5 m)
- EXTENT OF TOPOGRAPHIC/BATHYMETRIC SURVEY (SEE REFERENCE 2)
- TAILINGS IMPOUNDMENT AREA ACCESS ROAD
- PIEZOMETER LOCATION

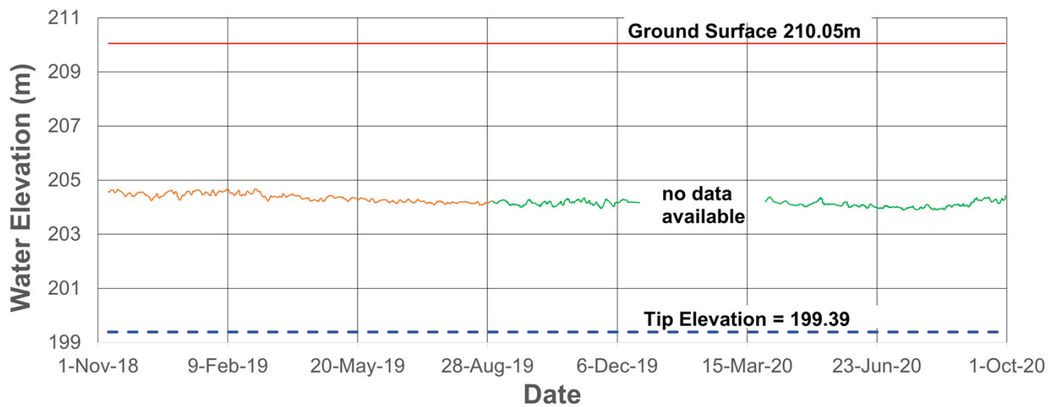
REFERENCES

1. SURFACE LEASE BOUNDARY FROM BARR ENGINEERING LTD. BASED ON TYPE A LAND USE PERMIT MV2019X0006, VALID TO 15 MAY 2024, MODIFIED BY GOLDER BASED ON 17 SEPTEMBER 2020 AMMENDMENT TO INCORPORATE LEASE BOUNDARY L-2000009T.
2. IMPOUNDMENT AREA TOPOGRAPHIC AND BATHYMETRIC SURVEY BY MASKWA ENGINEERING LTD., FILENAME: 18-034 Pine Point Tailings Topo Survey.dwg. SURVEY DATE: 2019-06-26, ORIGINAL SCALE 1:15,000. RECEIVED: 2019-08-12.
3. SURROUNDING AREA TOPOGRAPHIC SURVEY AND ORTHOPHOTO BY PHOTOSAT, FILENAME: pine_point_wo4077_survey.zip. SURVEY DATE 2019-07-14. RECEIVED: 2019-09-03 FROM TECK.

NOTES:
PLOTTED DATA DOES NOT INCLUDE ATMOSPHERIC PRESSURE CORRECTION. DATA EXPECTED TO VARY BY -4.3 KPA TO 2.5 KPA WITH CORRECTION
PIEZOMETRIC LEVELS BELOW TIP ELEVATION INDICATES DRY CONDITION AT TIP ELEVATION. PIEZOMETRIC SURFACE BELOW TIP ELEVATION NOT INDICATIVE OF PIEZOMETRIC LEVEL
ELEVATIONS SHOWN IN NAVD83







CLIENT
TECK METALS LTD.

CONSULTANT
GOLDER

YYYY-MM-DD	2020-12-14
PREPARED	BHR
DESIGNED	BHR
REVIEWED	MBW
APPROVED	BEW

PROJECT
PINE POINT TAILINGS IMPOUNDMENT AREA
2020 ANNUAL INSPECTION
PINE POINT, NT

TITLE
BOREHOLE BH18-B-01
VIBRATING WIRE PIEZOMETER PP-VWP-18-01A

PROJECT NO.	PHASE/TASK/DOC	REV.	FIGURE
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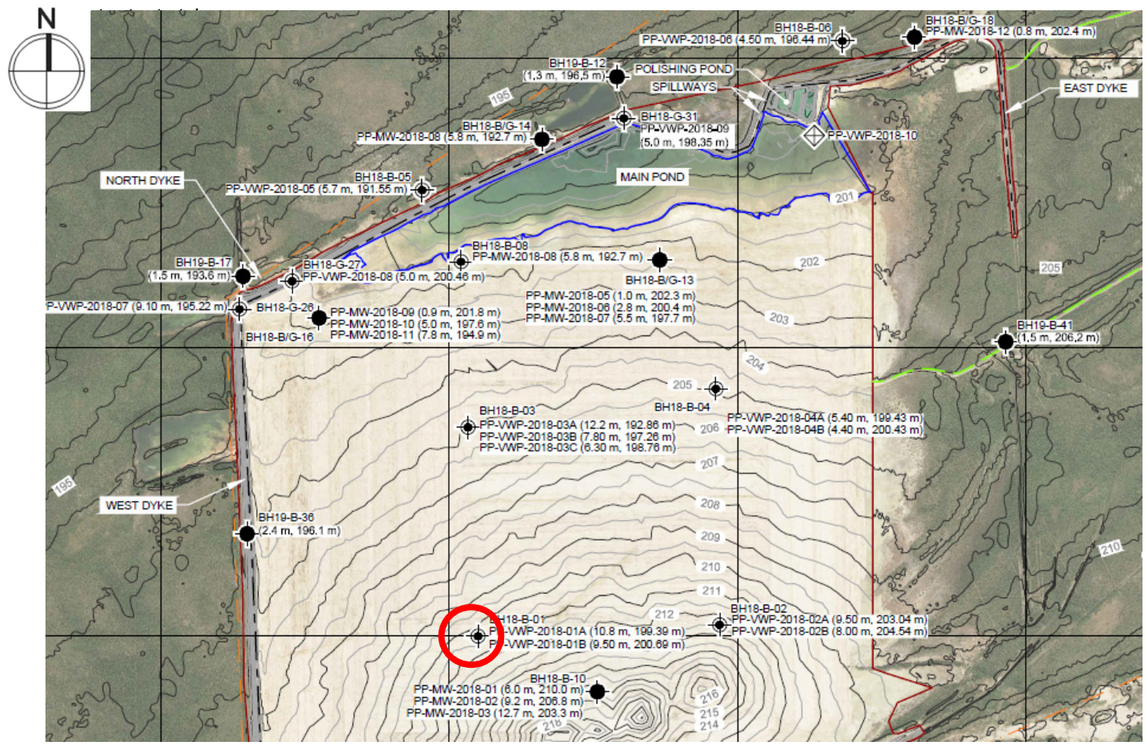
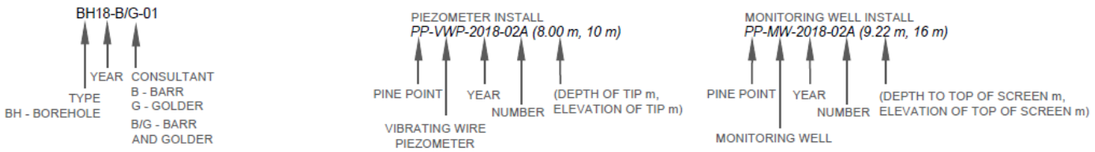


INVESTIGATION NAMING CONVENTION



LEGEND

- BOREHOLE
- BOREHOLE WITH NESTED WELL
- BOREHOLE WITH PIEZOMETER
- MAIN POND PIEZOMETER
- APPROXIMATE DYKE CRESTS
- APPROXIMATE SURFACE LEASE BOUNDARY (SEE REFERENCE 1)
- EXTENT OF MAIN POND (SEE REFERENCE 2)
- MAJOR TOPOGRAPHIC CONTOUR (INTERVAL = 1 m)
- MINOR TOPOGRAPHIC CONTOUR (INTERVAL = 0.5 m)
- EXTENT OF TOPOGRAPHIC/BATHYMETRIC SURVEY (SEE REFERENCE 2)
- TAILINGS IMPOUNDMENT AREA ACCESS ROAD
- PIEZOMETER LOCATION

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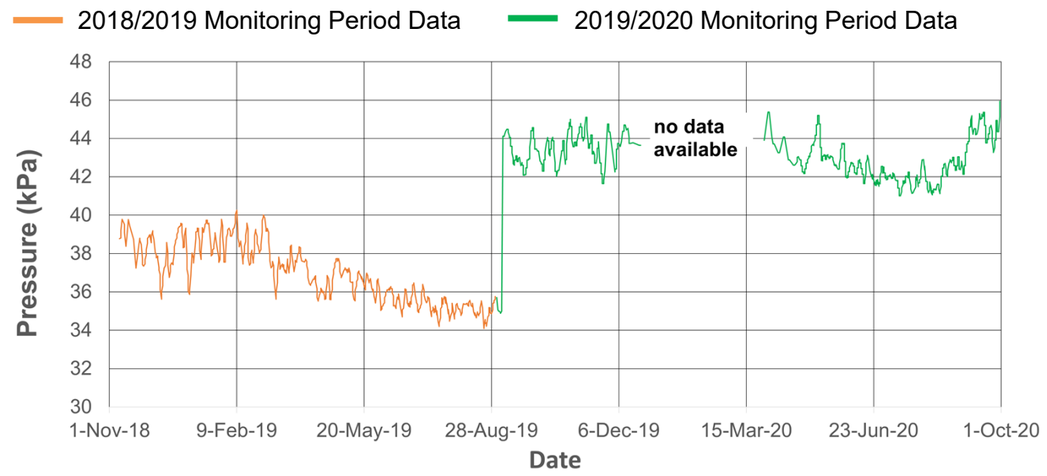
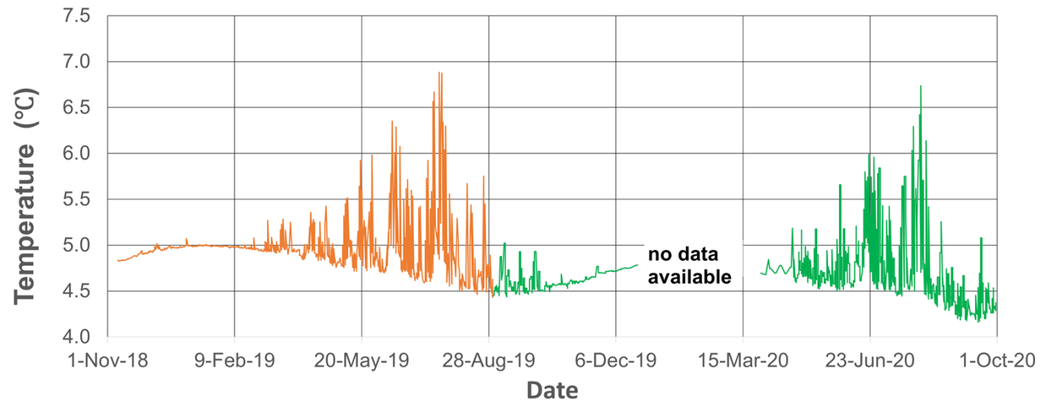
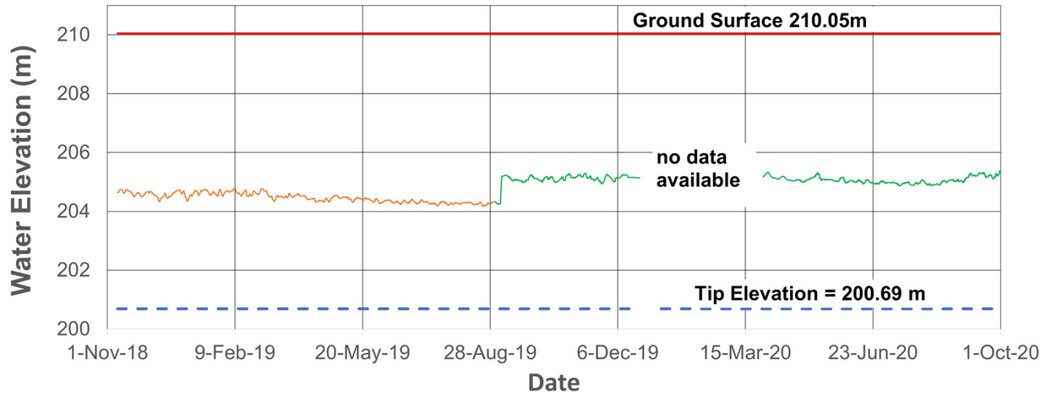
ELEVATIONS SHOWN IN NAVD83







CLIENT
TECK METALS LTD.

CONSULTANT
GOLDER

YYYY-MM-DD	2020-12-14
PREPARED	BHR
DESIGNED	BHR
REVIEWED	MBW
APPROVED	BEW

PROJECT
PINE POINT TAILINGS IMPOUNDMENT AREA
2020 ANNUAL INSPECTION
PINE POINT, NT

TITLE
BOREHOLE BH18-B-01
VIBRATING WIRE PIEZOMETER PP-VWP-2018-01B

PROJECT NO.	PHASE/TASK/DOC	REV.	FIGURE
20140895	1000/1006/279	0	E-2

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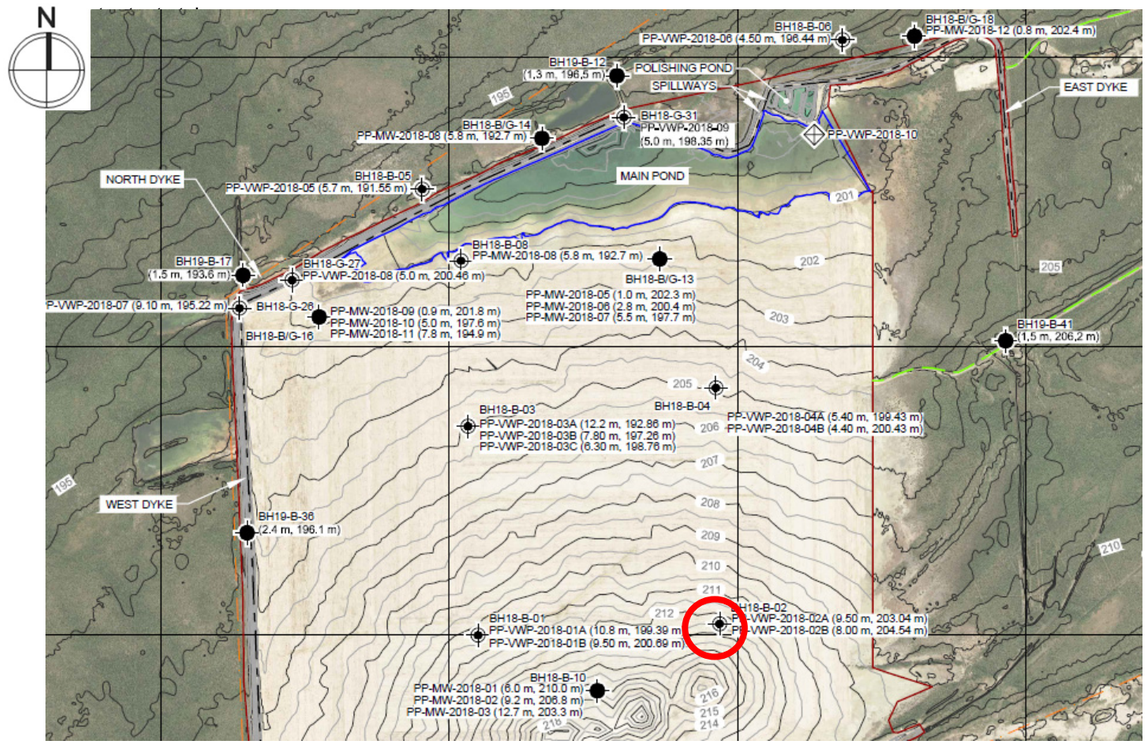
0 25 mm



INVESTIGATION NAMING CONVENTION

BH18-B/G-01

- BH – BOREHOLE
- YEAR
- CONSULTANT: B – BARR; G – GOLDER; B/G – BARR AND GOLDER

PIEZOMETER INSTALL
PP-VWP-2018-02A (8.00 m, 10 m)

- PP – VIBRATING WIRE PIEZOMETER
- PINE POINT
- YEAR
- NUMBER
- (DEPTH OF TIP m, ELEVATION OF TIP m)

MONITORING WELL INSTALL
PP-MW-2018-02A (9.22 m, 16 m)

- PP – MONITORING WELL
- PINE POINT
- YEAR
- NUMBER
- (DEPTH TO TOP OF SCREEN m, ELEVATION OF TOP OF SCREEN m)

LEGEND

- BOREHOLE
- BOREHOLE WITH NESTED WELL
- BOREHOLE WITH PIEZOMETER
- MAIN POND PIEZOMETER
- APPROXIMATE DYKE CRESTS
- APPROXIMATE SURFACE LEASE BOUNDARY (SEE REFERENCE 1)
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- TAILINGS IMPOUNDMENT AREA ACCESS ROAD
- PIEZOMETER LOCATION

REFERENCES

1. SURFACE LEASE BOUNDARY FROM BARR ENGINEERING LTD. BASED ON TYPE A LAND USE PERMIT MV2019X0006, VALID TO 15 MAY 2024, MODIFIED BY GOLDER BASED ON 17 SEPTEMBER 2020 AMMENDMENT TO INCORPORATE LEASE BOUNDARY L-2000009T.
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NOTES:
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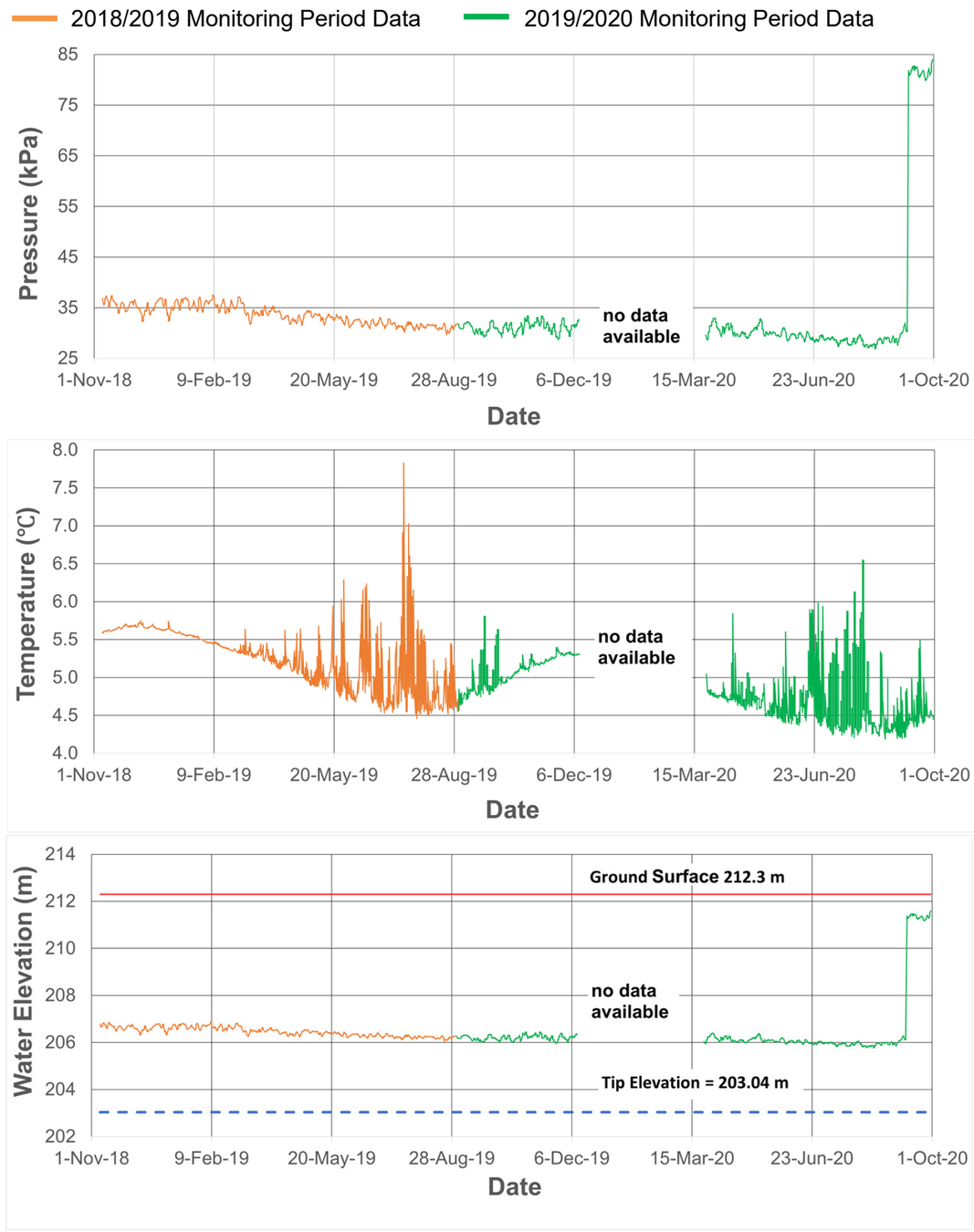
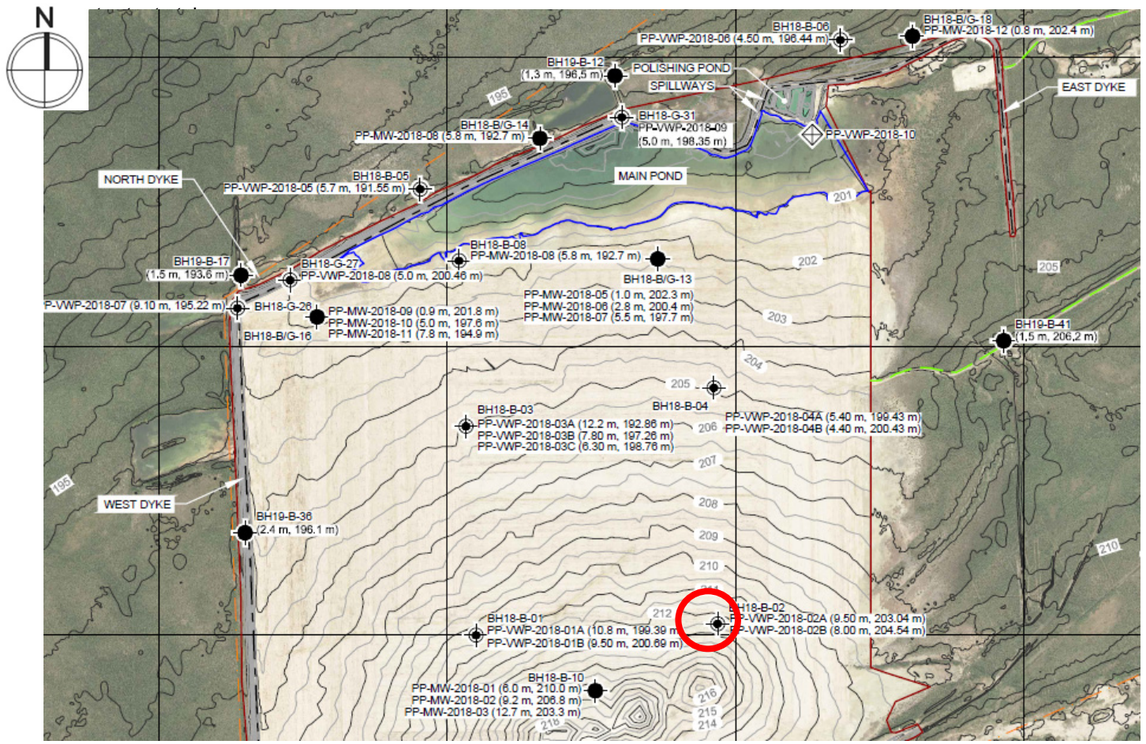
ELEVATIONS SHOWN IN NAVD83



CLIENT	TECK METALS LTD.
CONSULTANT	GOLDER
PROJECT	PINE POINT TAILINGS IMPOUNDMENT AREA 2020 ANNUAL INSPECTION PINE POINT, NT
TITLE	BOREHOLE BH18-B-02 VIBRATING WIRE PIEZOMETER PP-VWP-2018-02A

YYYY-MM-DD	2020-12-14
PREPARED	BHR
DESIGNED	BHR
REVIEWED	MBW
APPROVED	BEW

PROJECT NO.	PHASE/TASK/DOC.	REV.	FIGURE
20140895	1000/1006/279	0	E-3



INVESTIGATION NAMING CONVENTION

BH18-B/G-01

- BH - BOREHOLE
- TYPE
- YEAR
- CONSULTANT: B - BARR; G - GOLDER; B/G - BARR AND GOLDER

PIEZOMETER INSTALL
PP-VWP-2018-02A (8.00 m, 10 m)

- PP - VIBRATING WIRE PIEZOMETER
- PINE POINT
- YEAR
- NUMBER
- (DEPTH OF TIP m, ELEVATION OF TIP m)

MONITORING WELL INSTALL
PP-MW-2018-02A (9.22 m, 16 m)

- MW - MONITORING WELL
- PINE POINT
- YEAR
- NUMBER
- (DEPTH TO TOP OF SCREEN m, ELEVATION OF TOP OF SCREEN m)

LEGEND

- BOREHOLE
- BOREHOLE WITH NESTED WELL
- BOREHOLE WITH PIEZOMETER
- MAIN POND PIEZOMETER
- APPROXIMATE DYKE CRESTS
- APPROXIMATE SURFACE LEASE BOUNDARY (SEE REFERENCE 1)
- EXTENT OF MAIN POND (SEE REFERENCE 2)
- MAJOR TOPOGRAPHIC CONTOUR (INTERVAL = 1 m)
- MINOR TOPOGRAPHIC CONTOUR (INTERVAL = 0.5 m)
- EXTENT OF TOPOGRAPHIC/BATHYMETRIC SURVEY (SEE REFERENCE 2)
- TAILINGS IMPOUNDMENT AREA ACCESS ROAD
- PIEZOMETER LOCATION

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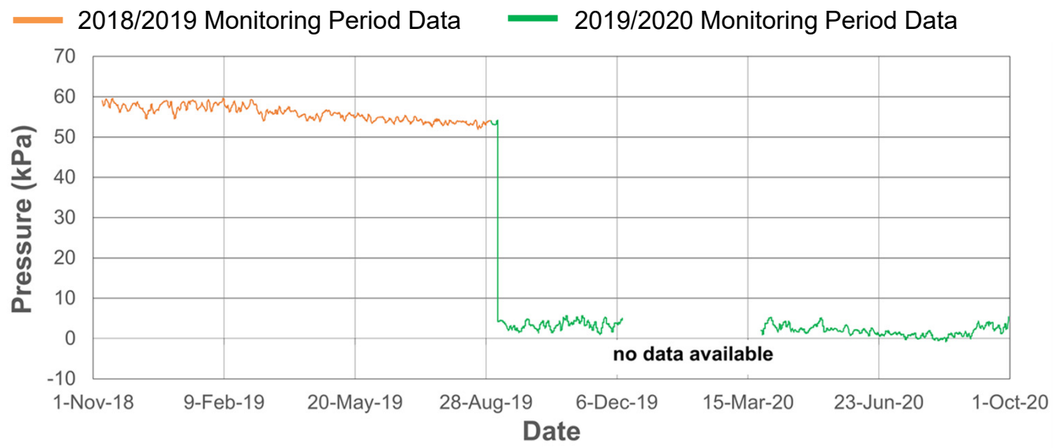
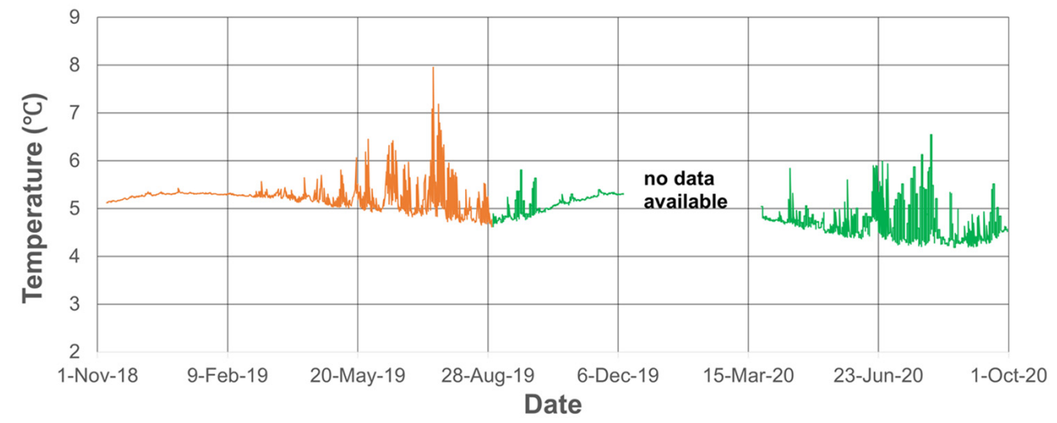
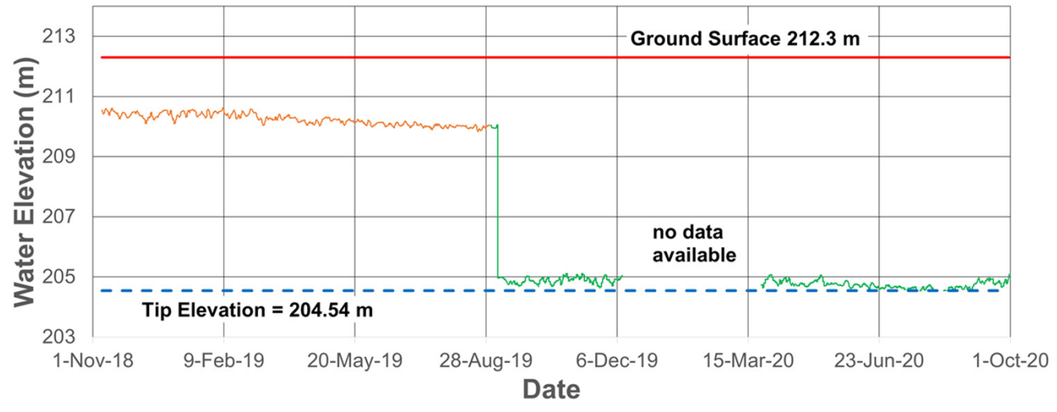
ELEVATIONS SHOWN IN NAVD83







CLIENT
TECK METALS LTD.

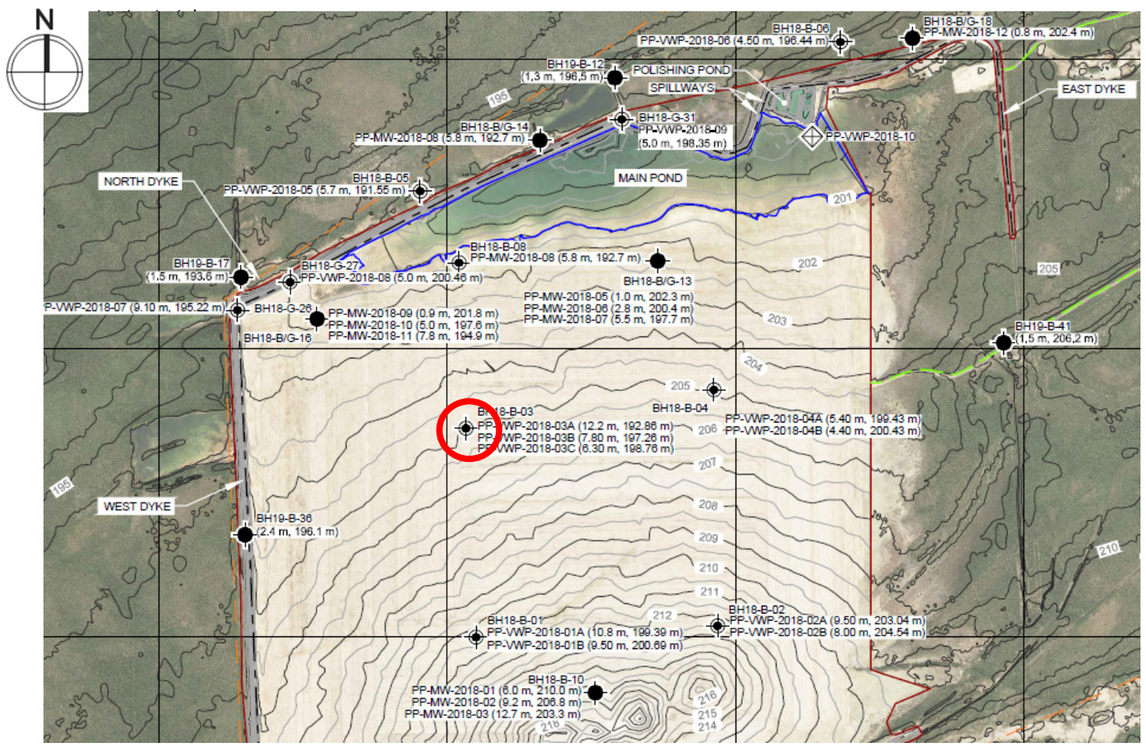
CONSULTANT
GOLDER

YYYY-MM-DD	2020-12-14
PREPARED	BHR
DESIGNED	BHR
REVIEWED	MBW
APPROVED	BEW

PROJECT
PINE POINT TAILINGS IMPOUNDMENT AREA
2020 ANNUAL INSPECTION
PINE POINT, NT

TITLE
BOREHOLE BH18-B-02
VIBRATING WIRE PIEZOMETER PP-VWP-2018-02B

PROJECT NO.	PHASE/TASK/DOC	REV.	FIGURE
20140895	1000/1006/279	0	E-4



INVESTIGATION NAMING CONVENTION

BH18-B/G-01

- TYPE: BH - BOREHOLE
- YEAR
- CONSULTANT: B - BARR; G - GOLDER; B/G - BARR AND GOLDER

PIEZOMETER INSTALL
PP-VWP-2018-02A (8.00 m, 10 m)

- PINE POINT
- YEAR
- NUMBER
- (DEPTH OF TIP m, ELEVATION OF TIP m)
- VIBRATING WIRE PIEZOMETER

MONITORING WELL INSTALL
PP-MW-2018-02A (9.22 m, 16 m)

- PINE POINT
- YEAR
- NUMBER
- (DEPTH TO TOP OF SCREEN m, ELEVATION OF TOP OF SCREEN m)
- MONITORING WELL

LEGEND

- BOREHOLE
- BOREHOLE WITH NESTED WELL
- BOREHOLE WITH PIEZOMETER
- MAIN POND PIEZOMETER
- APPROXIMATE DYKE CRESTS
- APPROXIMATE SURFACE LEASE BOUNDARY (SEE REFERENCE 1)
- EXTENT OF MAIN POND (SEE REFERENCE 2)
- MAJOR TOPOGRAPHIC CONTOUR (INTERVAL = 1 m)
- MINOR TOPOGRAPHIC CONTOUR (INTERVAL = 0.5 m)
- EXTENT OF TOPOGRAPHIC/BATHYMETRIC SURVEY (SEE REFERENCE 2)
- TAILINGS IMPOUNDMENT AREA ACCESS ROAD
- PIEZOMETER LOCATION

REFERENCES

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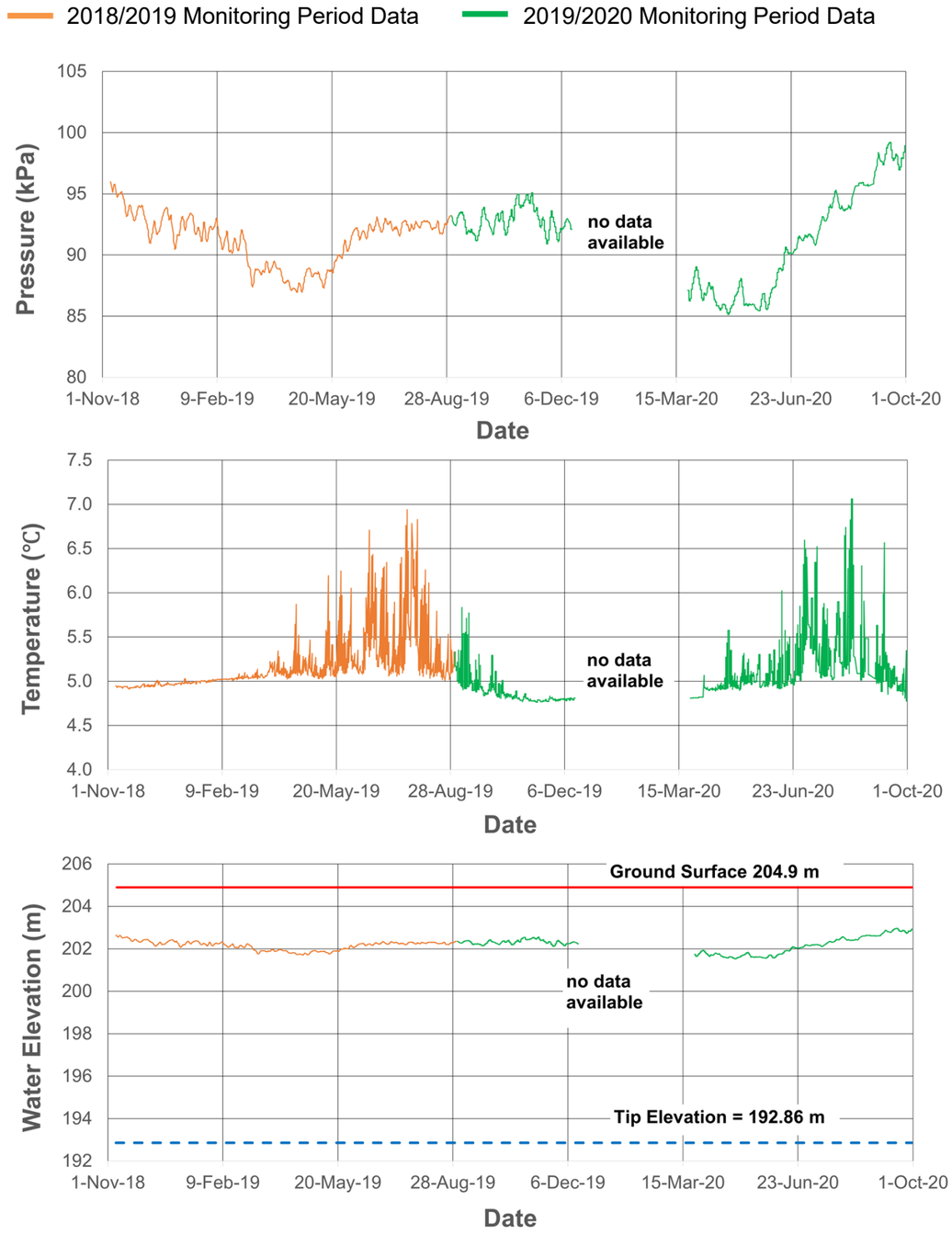
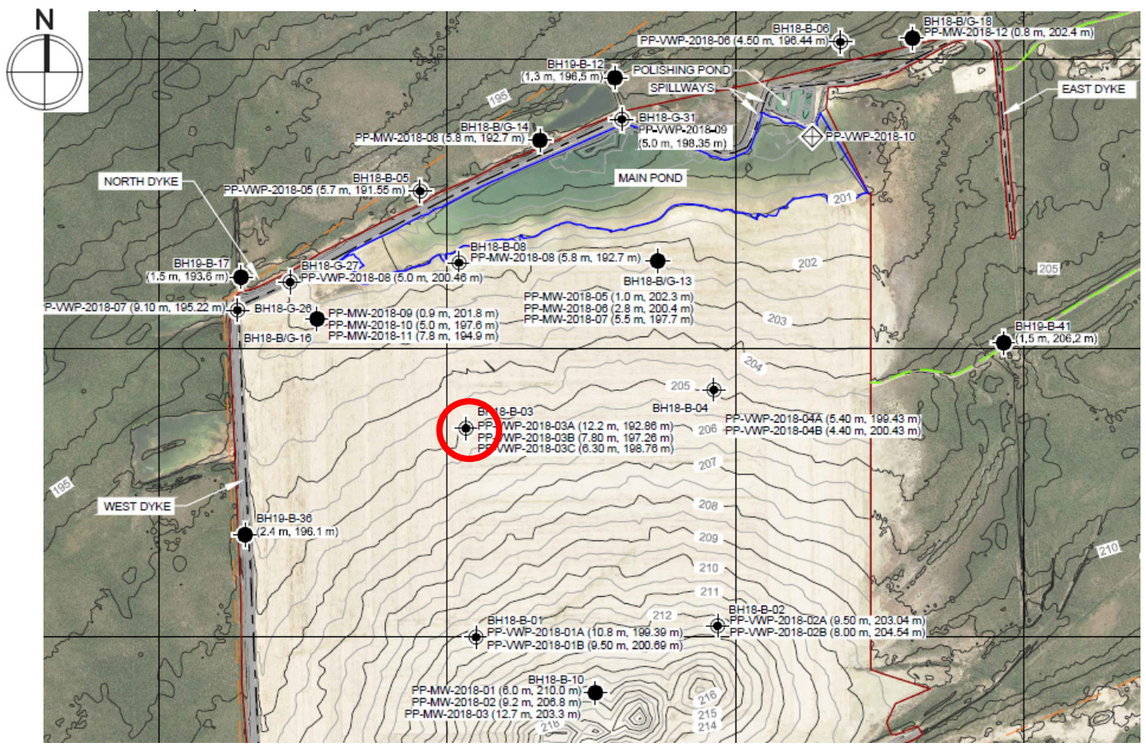
ELEVATIONS SHOWN IN NAVD83



CLIENT	TECK METALS LTD.
CONSULTANT	GOLDER
YYYY-MM-DD	2020-12-14
PREPARED	BHR
DESIGNED	BHR
REVIEWED	MBW
APPROVED	BEW
PROJECT	PINE POINT TAILINGS IMPOUNDMENT AREA 2020 ANNUAL INSPECTION PINE POINT, NT
TITLE	BOREHOLE BH18-B-03 VIBRATING WIRE PIEZOMETER PP-VWP-2018-03A
PROJECT NO.	20140895
PHASE/TASK/DOC	1000/1006/279
REV.	0
FIGURE	E-5



INVESTIGATION NAMING CONVENTION

BH18-B/G-01

- BH – BOREHOLE
- TYPE
- YEAR
- CONSULTANT: B - BARR; G - GOLDER; B/G - BARR AND GOLDER

PIEZOMETER INSTALL
PP-VWP-2018-02A (8.00 m, 10 m)

- PP – PINE POINT
- VWP – VIBRATING WIRE PIEZOMETER
- YEAR
- NUMBER
- (DEPTH OF TIP m, ELEVATION OF TIP m)

MONITORING WELL INSTALL
PP-MW-2018-02A (9.22 m, 16 m)

- PP – PINE POINT
- MW – MONITORING WELL
- YEAR
- NUMBER
- (DEPTH TO TOP OF SCREEN m, ELEVATION OF TOP OF SCREEN m)

LEGEND

- BOREHOLE
- BOREHOLE WITH NESTED WELL
- BOREHOLE WITH PIEZOMETER
- MAIN POND PIEZOMETER
- APPROXIMATE DYKE CRESTS
- APPROXIMATE SURFACE LEASE BOUNDARY (SEE REFERENCE 1)
- EXTENT OF MAIN POND (SEE REFERENCE 2)
- MAJOR TOPOGRAPHIC CONTOUR (INTERVAL = 1 m)
- MINOR TOPOGRAPHIC CONTOUR (INTERVAL = 0.5 m)
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- TAILINGS IMPOUNDMENT AREA ACCESS ROAD
- PIEZOMETER LOCATION

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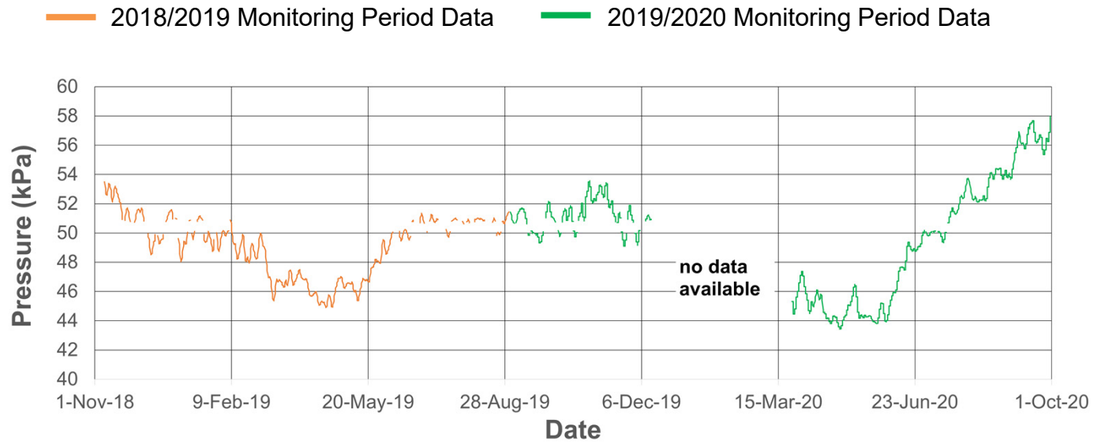
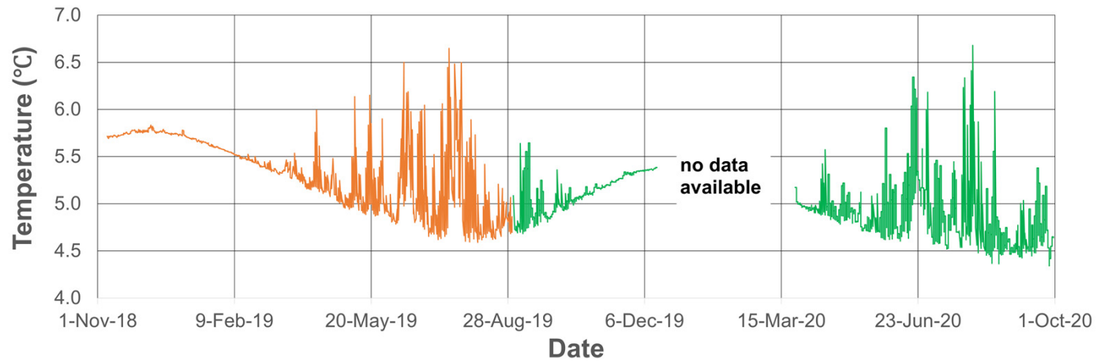
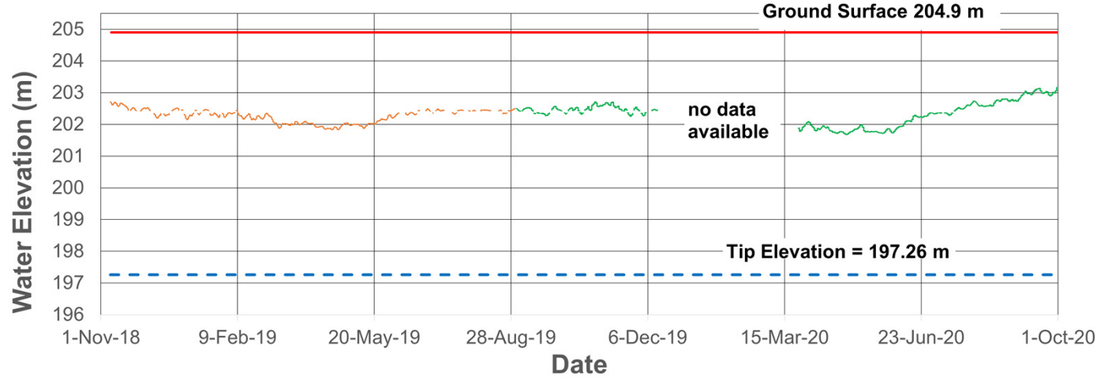
ELEVATIONS SHOWN IN NAVD83







CLIENT
TECK METALS LTD.

CONSULTANT
GOLDER

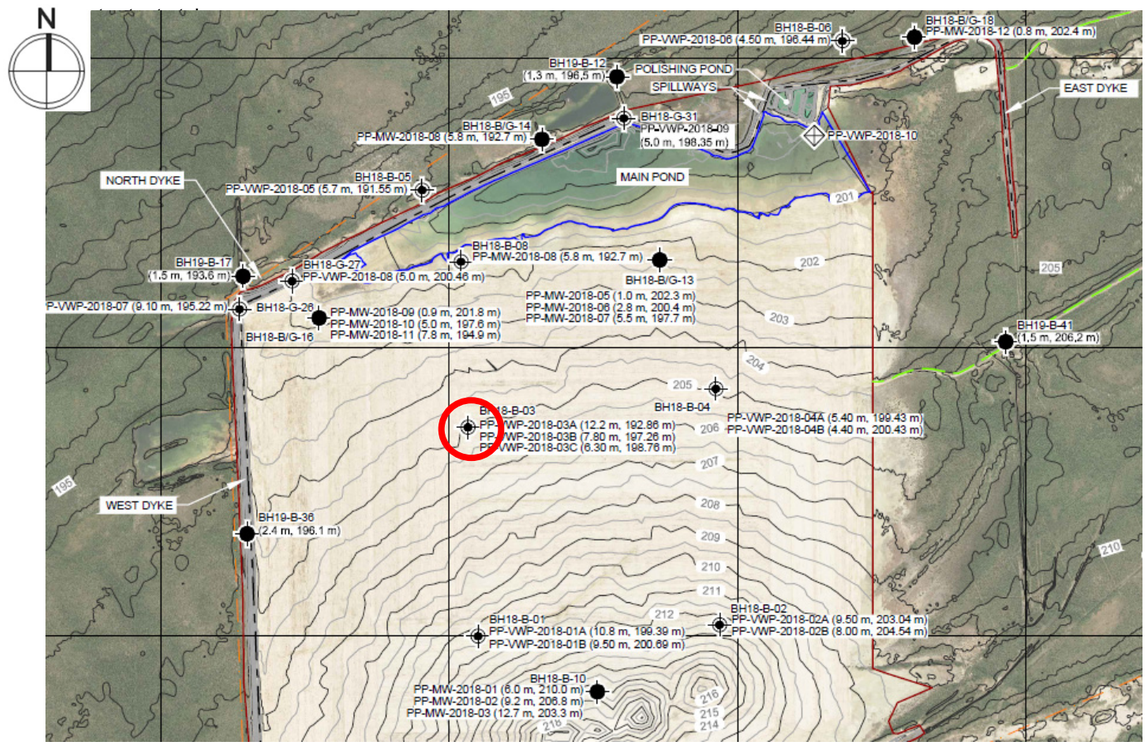
YYYY-MM-DD	2020-12-14
PREPARED	BHR
DESIGNED	BHR
REVIEWED	MBW
APPROVED	BEW

PROJECT
PINE POINT TAILINGS IMPOUNDMENT AREA
2020 ANNUAL INSPECTION
PINE POINT, NT

TITLE
BOREHOLE BH18-B-03
VIBRATING WIRE PIEZOMETER PP-VWP-2018-03B

PROJECT NO.	PHASE/TASK/DOC.	REV.	FIGURE
20140895	1000/1006/279	0	E-6

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
25 mm
0



INVESTIGATION NAMING CONVENTION

BH18-B/G-01
- TYPE: BH - BOREHOLE
- YEAR
- CONSULTANT: B - BARR; G - GOLDER; B/G - BARR AND GOLDER

PIEZOMETER INSTALL
PP-VWP-2018-02A (8.00 m, 10 m)
- PP-VWP-2018-02A: VIBRATING WIRE PIEZOMETER
- PINE POINT
- YEAR
- NUMBER
- (DEPTH OF TIP m, ELEVATION OF TIP m)

MONITORING WELL INSTALL
PP-MW-2018-02A (9.22 m, 16 m)
- PP-MW-2018-02A: MONITORING WELL
- PINE POINT
- YEAR
- NUMBER
- (DEPTH TO TOP OF SCREEN m, ELEVATION OF TOP OF SCREEN m)

LEGEND

- BOREHOLE
- BOREHOLE WITH NESTED WELL
- BOREHOLE WITH PIEZOMETER
- MAIN POND PIEZOMETER
- APPROXIMATE DYKE CRESTS
- APPROXIMATE SURFACE LEASE BOUNDARY (SEE REFERENCE 1)
- EXTENT OF MAIN POND (SEE REFERENCE 2)
- MAJOR TOPOGRAPHIC CONTOUR (INTERVAL = 1 m)
- MINOR TOPOGRAPHIC CONTOUR (INTERVAL = 0.5 m)
- EXTENT OF TOPOGRAPHIC/BATHYMETRIC SURVEY (SEE REFERENCE 2)
- TAILINGS IMPOUNDMENT AREA ACCESS ROAD
- PIEZOMETER LOCATION

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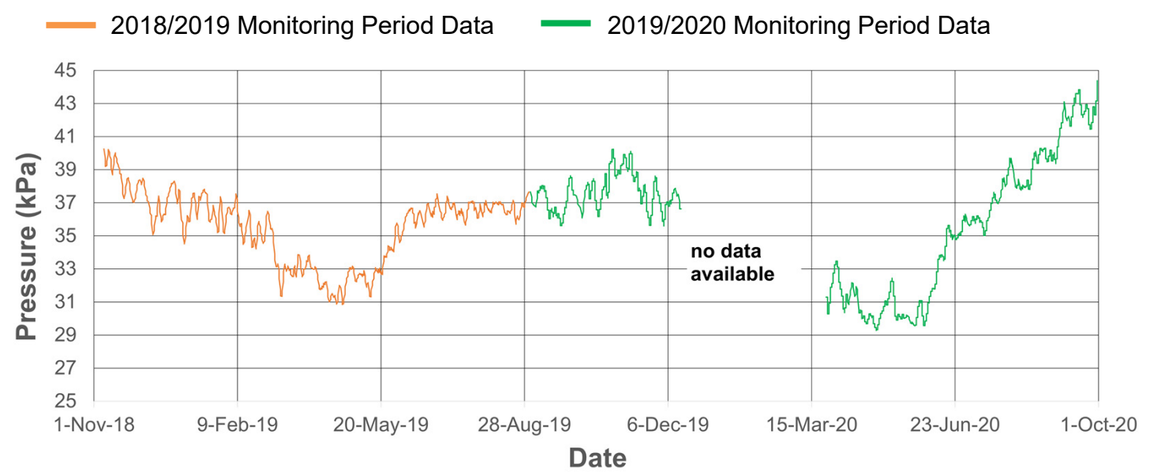
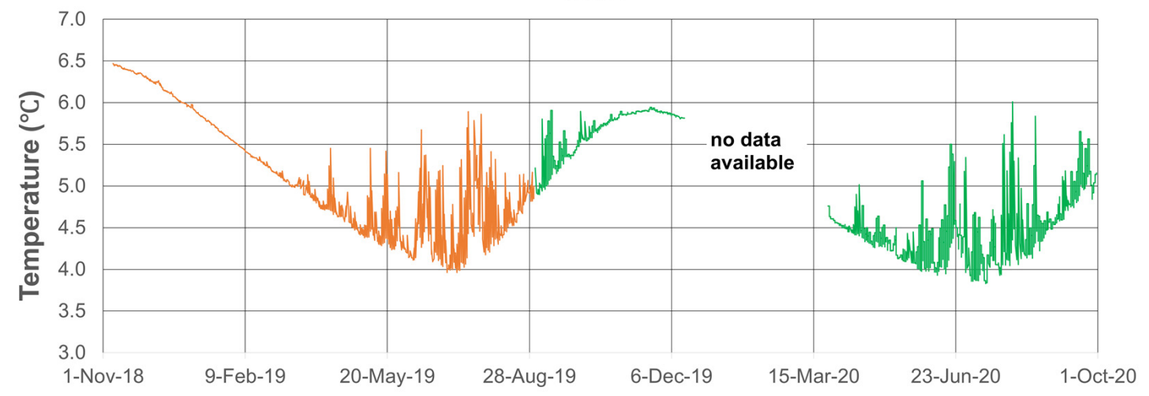
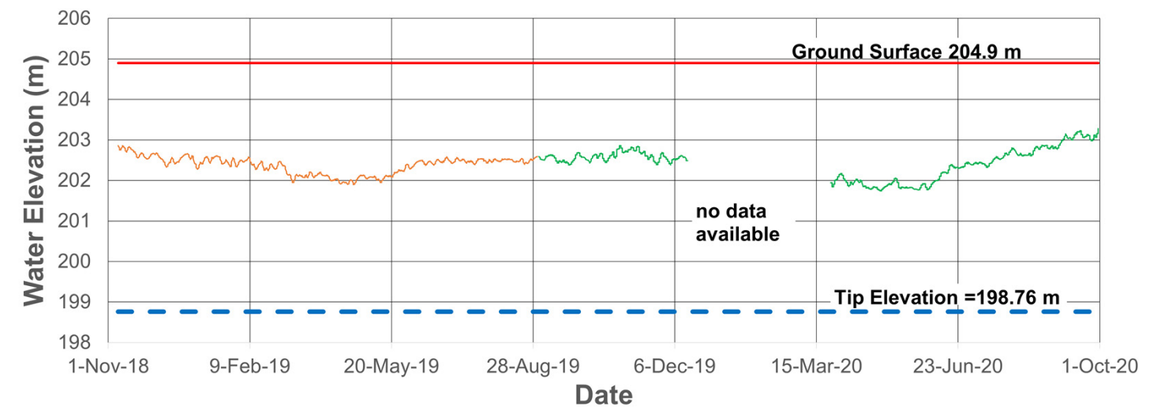
ELEVATIONS SHOWN IN NAVD83







CLIENT
TECK METALS LTD.

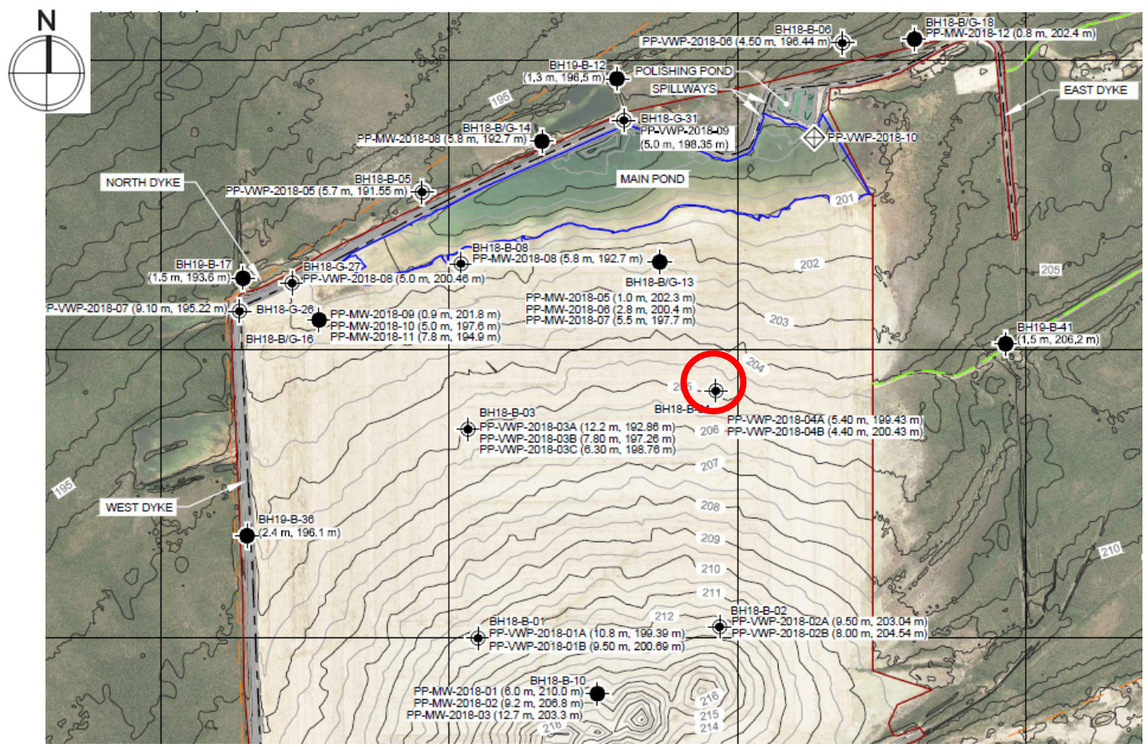
CONSULTANT
GOLDER

YYYY-MM-DD	2020-12-14
PREPARED	BHR
DESIGNED	BHR
REVIEWED	MBW
APPROVED	BEW

PROJECT
PINE POINT TAILINGS IMPOUNDMENT AREA
2020 ANNUAL INSPECTION
PINE POINT, NT

TITLE
BOREHOLE BH18-B-03
VIBRATING WIRE PIEZOMETER PP-VWP-2018-03C

PROJECT NO.	PHASE/TASK/DOC	REV.	FIGURE
20140895	1000/1006/279	0	E-7



INVESTIGATION NAMING CONVENTION

BH18-B/G-01
- BH18 – YEAR
- B – TYPE (BH - BOREHOLE)
- B/G – CONSULTANT (B - BARR; G - GOLDER; B/G - BARR AND GOLDER)

PIEZOMETER INSTALL
PP-VWP-2018-02A (8.00 m, 10 m)
- PP – PINE POINT
- VWP – VIBRATING WIRE PIEZOMETER
- 2018 – YEAR
- 02 – NUMBER
- A – (DEPTH OF TIP m, ELEVATION OF TIP m)

MONITORING WELL INSTALL
PP-MW-2018-02A (9.22 m, 16 m)
- PP – PINE POINT
- MW – MONITORING WELL
- 2018 – YEAR
- 02 – NUMBER
- A – (DEPTH TO TOP OF SCREEN m, ELEVATION OF TOP OF SCREEN m)

LEGEND

- BOREHOLE
- BOREHOLE WITH NESTED WELL
- BOREHOLE WITH PIEZOMETER
- MAIN POND PIEZOMETER
- APPROXIMATE DYKE CRESTS
- APPROXIMATE SURFACE LEASE BOUNDARY (SEE REFERENCE 1)
- EXTENT OF MAIN POND (SEE REFERENCE 2)
- MAJOR TOPOGRAPHIC CONTOUR (INTERVAL = 1 m)
- MINOR TOPOGRAPHIC CONTOUR (INTERVAL = 0.5 m)
- EXTENT OF TOPOGRAPHIC/BATHYMETRIC SURVEY (SEE REFERENCE 2)
- TAILINGS IMPOUNDMENT AREA ACCESS ROAD
- PIEZOMETER LOCATION

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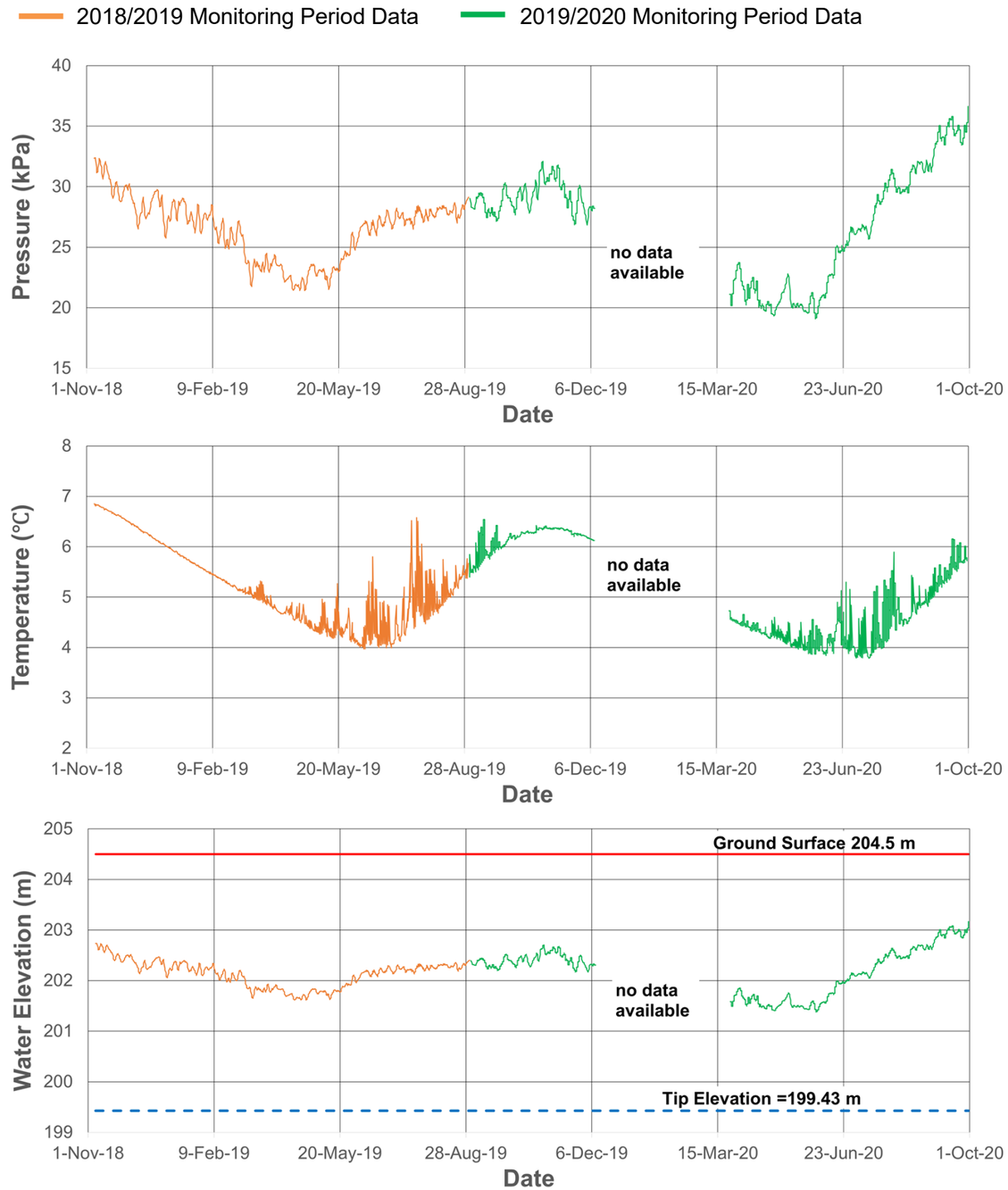


CLIENT
TECK METALS LTD.

CONSULTANT
GOLDER

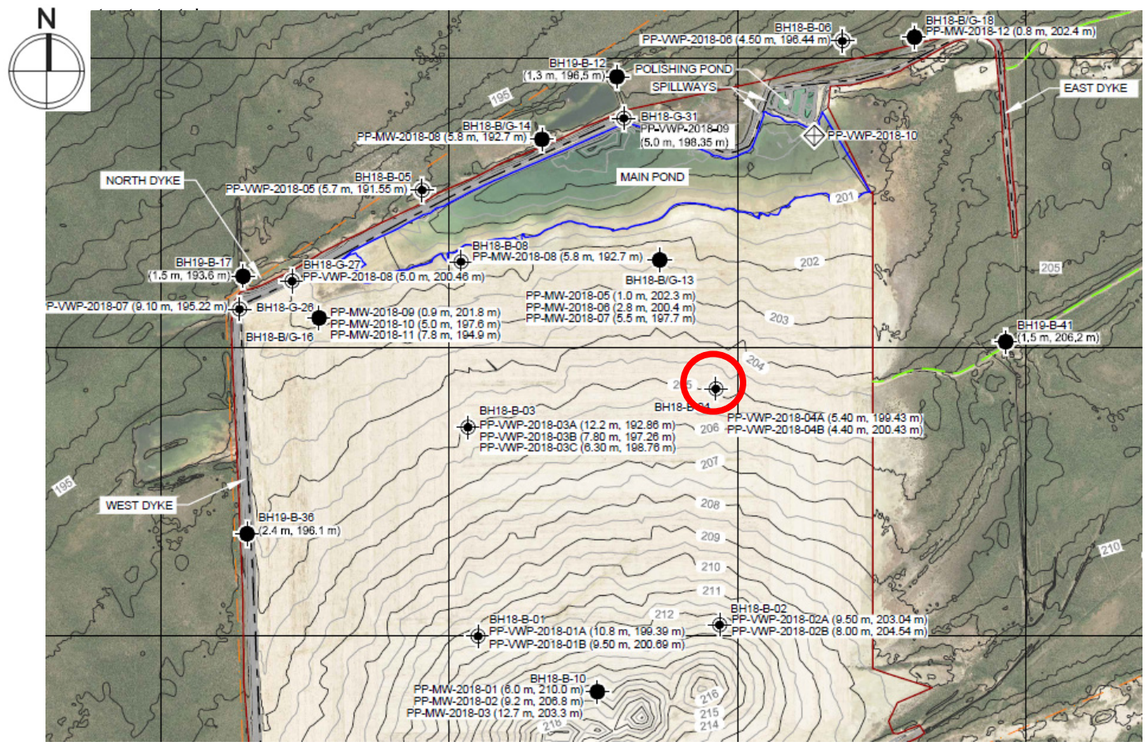
YYYY-MM-DD	2020-12-14
PREPARED	BHR
DESIGNED	BHR
REVIEWED	MBW
APPROVED	BEW

PROJECT
PINE POINT TAILINGS IMPOUNDMENT AREA
2020 ANNUAL INSPECTION
PINE POINT, NT

TITLE
BOREHOLE BH18-B-04
VIBRATING WIRE PIEZOMETER PP-VWP-2018-04A

PROJECT NO.	PHASE/TASK/DOC.	REV.	FIGURE
20140895	1000/1006/279	0	E-8

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
0 25 mm



INVESTIGATION NAMING CONVENTION

BH18-B/G-01

- BH - BOREHOLE (TYPE)
- 18 (YEAR)
- B - BARR, G - GOLDER, B/G - BARR AND GOLDER (CONSULTANT)
- 01 (NUMBER)

PIEZOMETER INSTALL
PP-VWP-2018-02A (8.00 m, 10 m)

- PP - VIBRATING WIRE PIEZOMETER
- 18 (YEAR)
- 02 (NUMBER)
- A (PINE POINT)
- 8.00 m (DEPTH OF TIP m, ELEVATION OF TIP m)

MONITORING WELL INSTALL
PP-MW-2018-02A (9.22 m, 16 m)

- PP - MONITORING WELL
- 18 (YEAR)
- 02 (NUMBER)
- A (PINE POINT)
- 9.22 m (DEPTH TO TOP OF SCREEN m, ELEVATION OF TOP OF SCREEN m)

LEGEND

- BOREHOLE
- BOREHOLE WITH NESTED WELL
- BOREHOLE WITH PIEZOMETER
- MAIN POND PIEZOMETER
- APPROXIMATE DYKE CRESTS
- APPROXIMATE SURFACE LEASE BOUNDARY (SEE REFERENCE 1)
- EXTENT OF MAIN POND (SEE REFERENCE 2)
- MAJOR TOPOGRAPHIC CONTOUR (INTERVAL = 1 m)
- MINOR TOPOGRAPHIC CONTOUR (INTERVAL = 0.5 m)
- EXTENT OF TOPOGRAPHIC/BATHYMETRIC SURVEY (SEE REFERENCE 2)
- TAILINGS IMPOUNDMENT AREA ACCESS ROAD
- PIEZOMETER LOCATION

REFERENCES

1. SURFACE LEASE BOUNDARY FROM BARR ENGINEERING LTD. BASED ON TYPE A LAND USE PERMIT MV2019X0006, VALID TO 15 MAY 2024, MODIFIED BY GOLDER BASED ON 17 SEPTEMBER 2020 AMMENDMENT TO INCORPORATE LEASE BOUNDARY L-2000009T.
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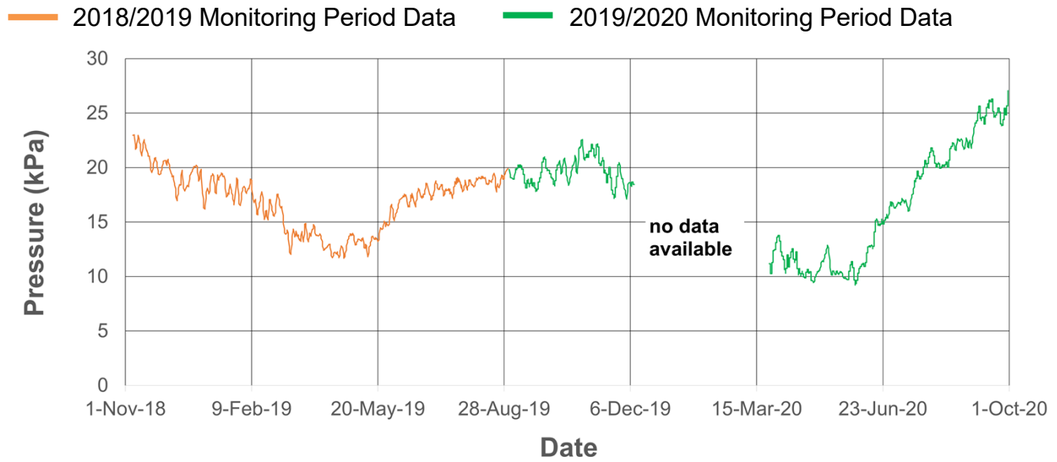
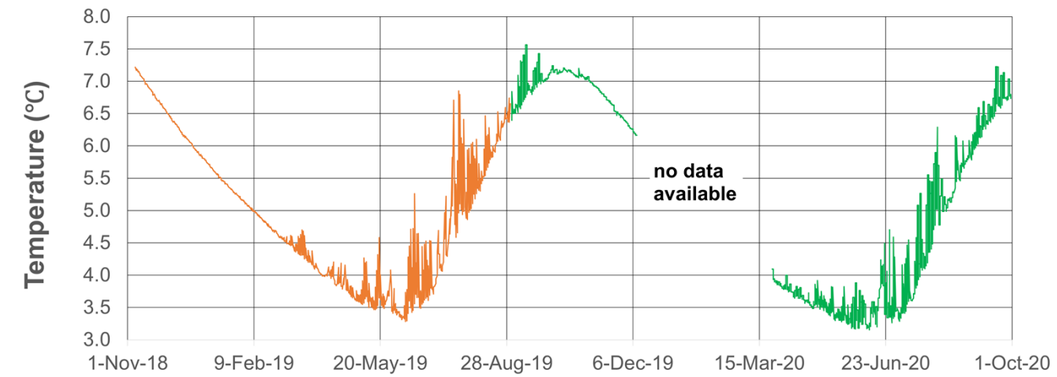
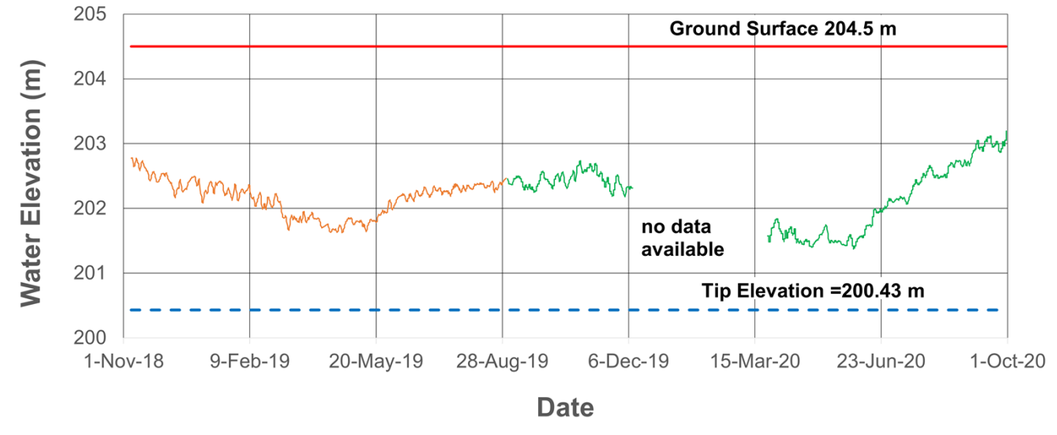
ELEVATIONS SHOWN IN NAVD83







CLIENT
TECK METALS LTD.

CONSULTANT
GOLDER

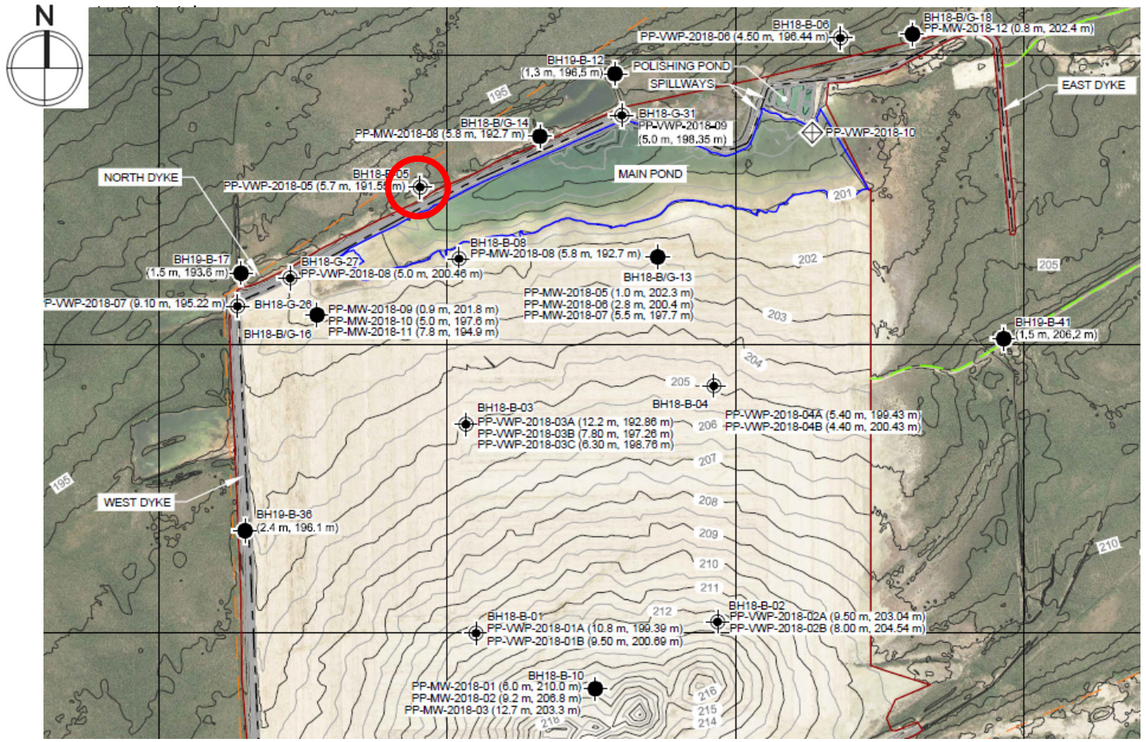
YYYY-MM-DD	2020-12-14
PREPARED	BHR
DESIGNED	BHR
REVIEWED	MBW
APPROVED	BEW

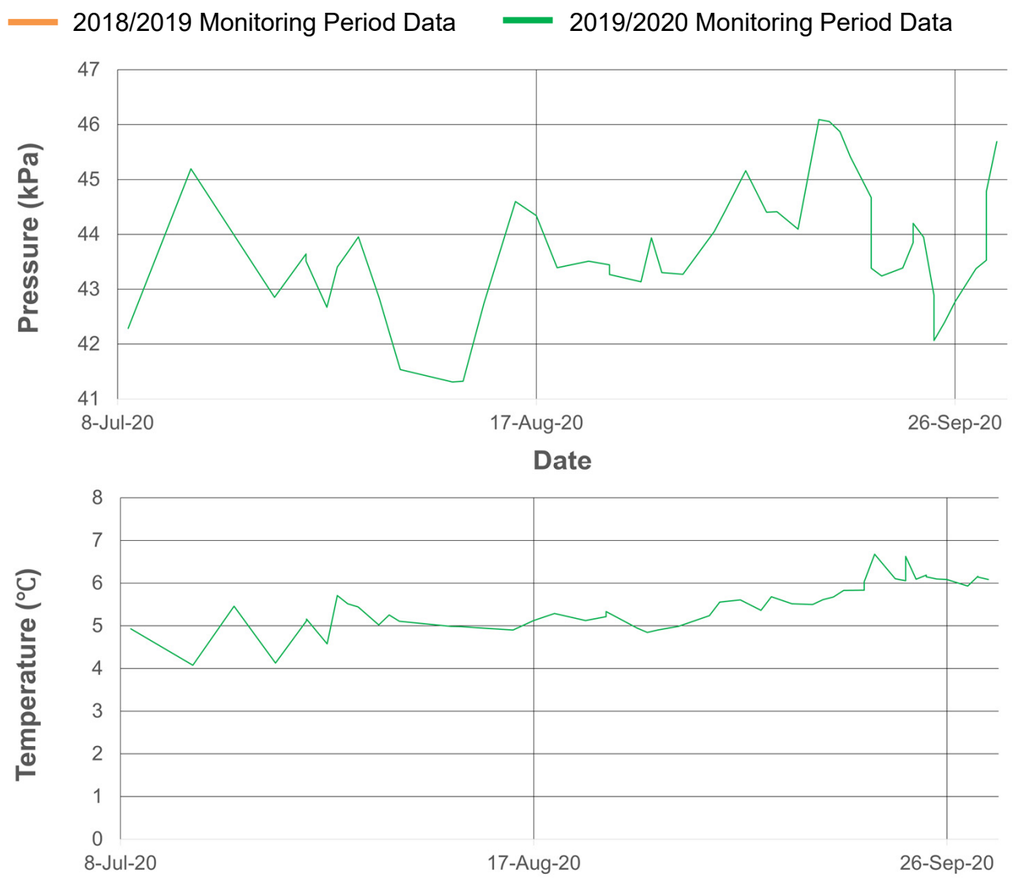
PROJECT
PINE POINT TAILINGS IMPOUNDMENT AREA
2020 ANNUAL INSPECTION
PINE POINT, NT

TITLE
BOREHOLE BH18-B-04
VIBRATING WIRE PIEZOMETER PP-VWP-2018-04B

PROJECT NO.	PHASE/TASK/DOC	REV.	FIGURE
20140895	1000/1006/279	0	E-9

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
0 25 mm





INVESTIGATION NAMING CONVENTION

BH18-B/G-01
- BH - BOREHOLE (TYPE)
- 18 (YEAR)
- B - BARR, G - GOLDER, B/G - BARR AND GOLDER (CONSULTANT)
- 01 (NUMBER)

PIEZOMETER INSTALL
PP-VWP-2018-02A (8.00 m, 10 m)
- PP - VIBRATING WIRE PIEZOMETER (PINE POINT)
- VWP - VIBRATING WIRE PIEZOMETER
- 2018 (YEAR)
- 02A (NUMBER)
- 8.00 m (DEPTH OF TIP m, ELEVATION OF TIP m)
- 10 m

MONITORING WELL INSTALL
PP-MW-2018-02A (9.22 m, 16 m)
- PP - MONITORING WELL (PINE POINT)
- MW - MONITORING WELL
- 2018 (YEAR)
- 02A (NUMBER)
- 9.22 m (DEPTH TO TOP OF SCREEN m, ELEVATION OF TOP OF SCREEN m)
- 16 m

LEGEND
- BOREHOLE
- BOREHOLE WITH NESTED WELL
- BOREHOLE WITH PIEZOMETER
- MAIN POND PIEZOMETER
- APPROXIMATE DYKE CRESTS
- APPROXIMATE SURFACE LEASE BOUNDARY (SEE REFERENCE 1)
- EXTENT OF MAIN POND (SEE REFERENCE 2)
- MAJOR TOPOGRAPHIC CONTOUR (INTERVAL = 1 m)
- MINOR TOPOGRAPHIC CONTOUR (INTERVAL = 0.5 m)
- EXTENT OF TOPOGRAPHIC/BATHYMETRIC SURVEY (SEE REFERENCE 2)
- TAILINGS IMPOUNDMENT AREA ACCESS ROAD
- PIEZOMETER LOCATION

REFERENCES

1. SURFACE LEASE BOUNDARY FROM BARR ENGINEERING LTD. BASED ON TYPE A LAND USE PERMIT MV2019X0006, VALID TO 15 MAY 2024, MODIFIED BY GOLDER BASED ON 17 SEPTEMBER 2020 AMMENDMENT TO INCORPORATE LEASE BOUNDARY L-2000009T.
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NOTES:
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ELEVATIONS SHOWN IN NAVD83

INSTRUMENT CALIBRATION TO BE CHECKED

CLIENT
TECK METALS LTD.

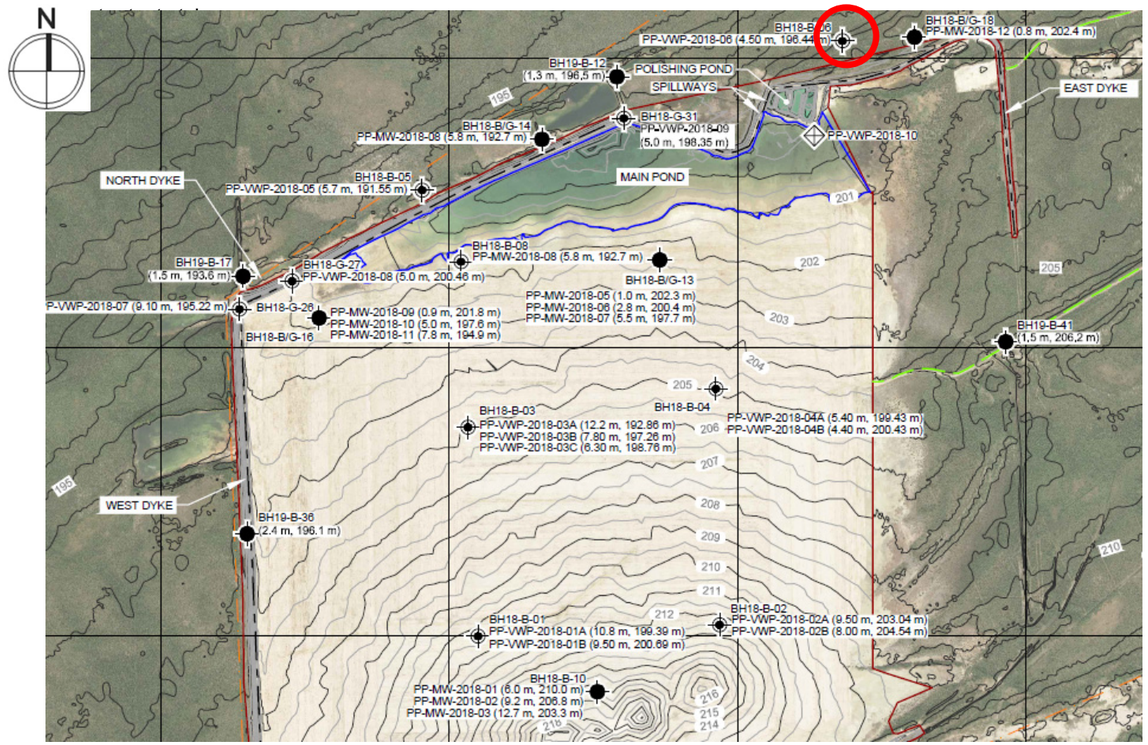
CONSULTANT
GOLDER

YYYY-MM-DD	2020-12-14
PREPARED	BHR
DESIGNED	BHR
REVIEWED	MBW
APPROVED	BEW

PROJECT
PINE POINT TAILINGS IMPOUNDMENT AREA
2020 ANNUAL INSPECTION
PINE POINT, NT

TITLE
BOREHOLE BH18-B-05
VIBRATING WIRE PIEZOMETER PP-VWP-2018-05

PROJECT NO.	PHASE/TASK/DOC	REV.	FIGURE
20140895	1000/1006/279	0	E-10



INVESTIGATION NAMING CONVENTION

BH18-B/G-01
- BH - BOREHOLE
- TYPE
- YEAR
- CONSULTANT: B - BARR; G - GOLDER; B/G - BARR AND GOLDER

PIEZOMETER INSTALL
PP-VWP-2018-02A (8.00 m, 10 m)
- PP - VIBRATING WIRE PIEZOMETER
- PINE POINT
- YEAR
- NUMBER
- (DEPTH OF TIP m, ELEVATION OF TIP m)

MONITORING WELL INSTALL
PP-MW-2018-02A (9.22 m, 16 m)
- MW - MONITORING WELL
- PINE POINT
- YEAR
- NUMBER
- (DEPTH TO TOP OF SCREEN m, ELEVATION OF TOP OF SCREEN m)

LEGEND

- BOREHOLE
- BOREHOLE WITH NESTED WELL
- BOREHOLE WITH PIEZOMETER
- MAIN POND PIEZOMETER
- APPROXIMATE DYKE CRESTS
- APPROXIMATE SURFACE LEASE BOUNDARY (SEE REFERENCE 1)
- EXTENT OF MAIN POND (SEE REFERENCE 2)
- MAJOR TOPOGRAPHIC CONTOUR (INTERVAL = 1 m)
- MINOR TOPOGRAPHIC CONTOUR (INTERVAL = 0.5 m)
- EXTENT OF TOPOGRAPHIC/BATHYMETRIC SURVEY (SEE REFERENCE 2)
- TAILINGS IMPOUNDMENT AREA ACCESS ROAD
- PIEZOMETER LOCATION

REFERENCES

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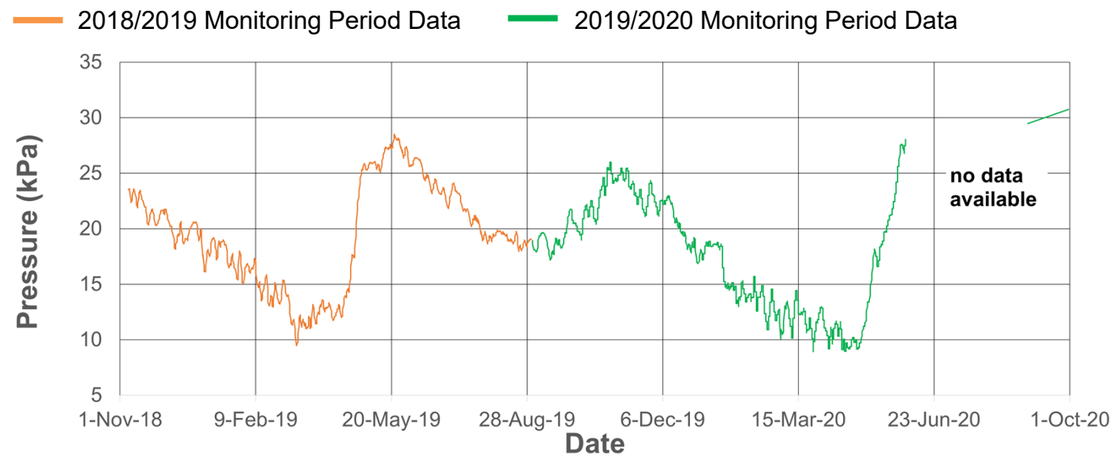
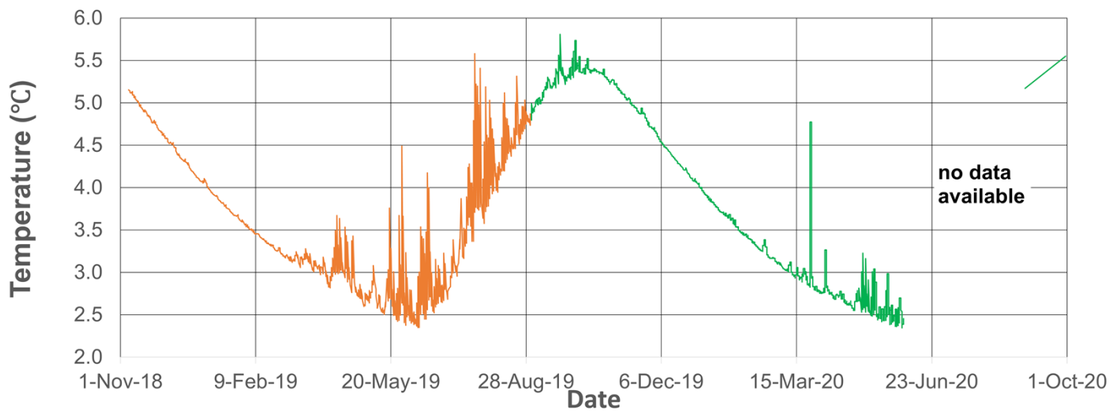
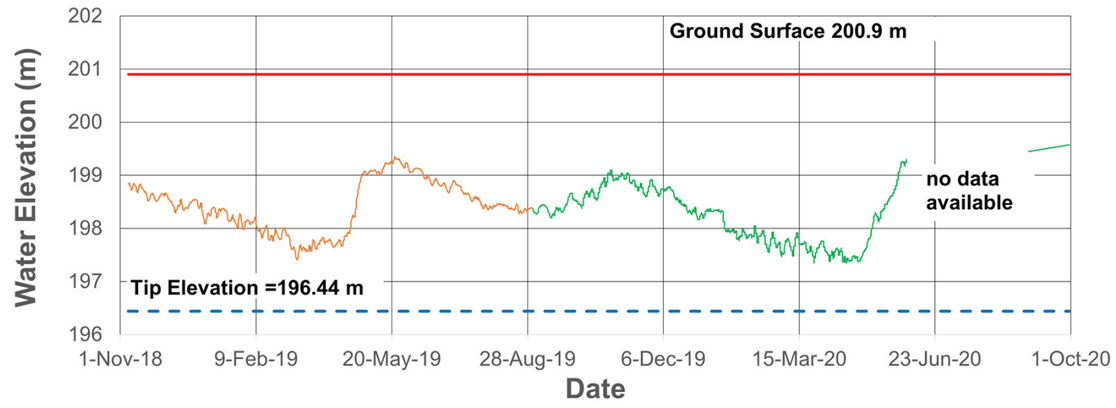
ELEVATIONS SHOWN IN NAVD83







CLIENT
TECK METALS LTD.

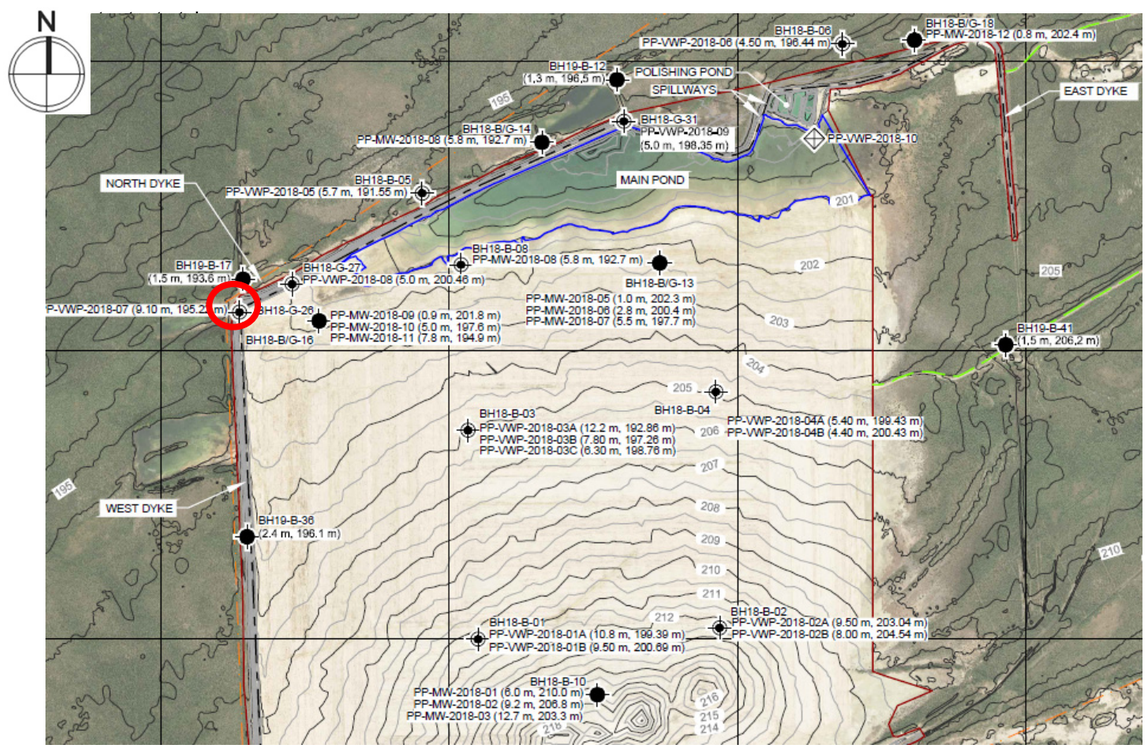
CONSULTANT
GOLDER

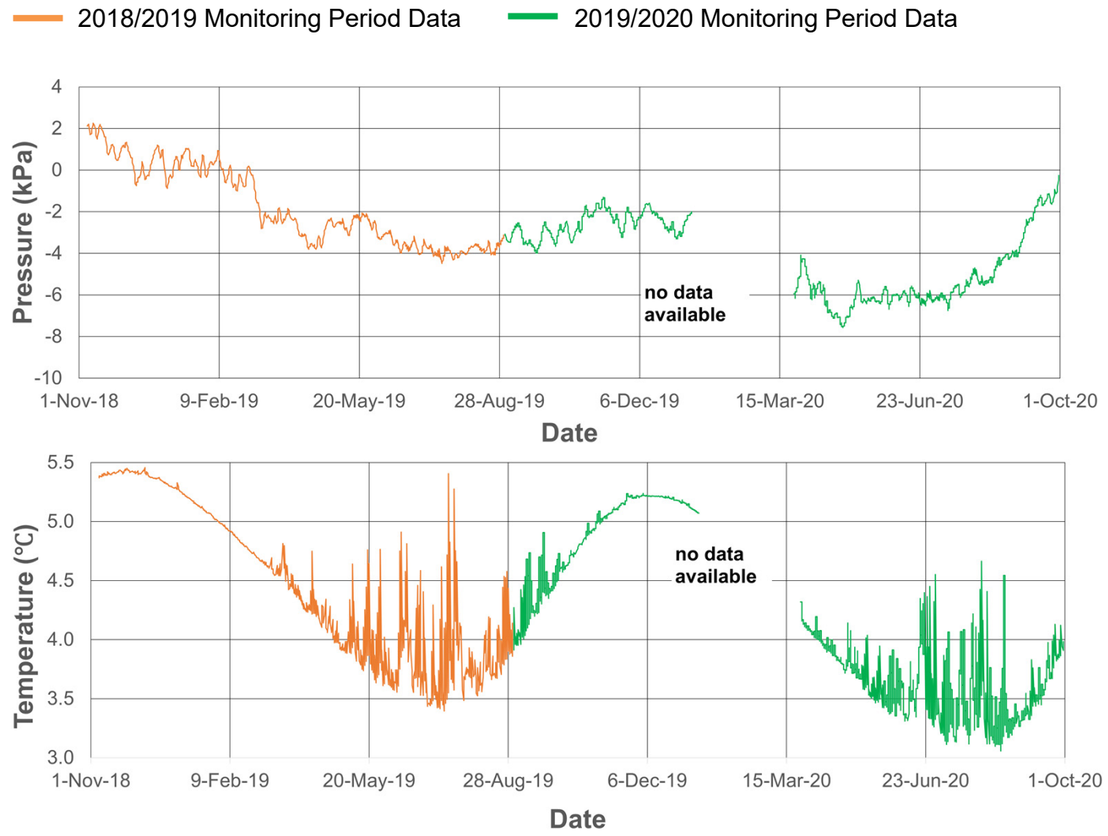
YYYY-MM-DD	2020-12-14
PREPARED	BHR
DESIGNED	BHR
REVIEWED	MBW
APPROVED	BEW

PROJECT
PINE POINT TAILINGS IMPOUNDMENT AREA
2020 ANNUAL INSPECTION
PINE POINT, NT

TITLE
BOREHOLE BH18-B-06
VIBRATING WIRE PIEZOMETER PP-VWP-2018-06

PROJECT NO.	PHASE/TASK/DOC	REV.	FIGURE
20140895	1000/1006/279	0	E-11





INVESTIGATION NAMING CONVENTION

BH18-B/G-01
- YEAR
- CONSULTANT: B - BARR; G - GOLDER; B/G - BARR AND GOLDER
- TYPE: BH - BOREHOLE

PIEZOMETER INSTALL
PP-VWP-2018-02A (8.00 m, 10 m)
- PINE POINT
- VIBRATING WIRE PIEZOMETER
- YEAR
- NUMBER
- (DEPTH OF TIP m, ELEVATION OF TIP m)

MONITORING WELL INSTALL
PP-MW-2018-02A (9.22 m, 16 m)
- PINE POINT
- MONITORING WELL
- YEAR
- NUMBER
- (DEPTH TO TOP OF SCREEN m, ELEVATION OF TOP OF SCREEN m)

LEGEND
- BOREHOLE
- BOREHOLE WITH NESTED WELL
- BOREHOLE WITH PIEZOMETER
- MAIN POND PIEZOMETER
- APPROXIMATE DYKE CRESTS
- APPROXIMATE SURFACE LEASE BOUNDARY (SEE REFERENCE 1)
- EXTENT OF MAIN POND (SEE REFERENCE 2)
- MAJOR TOPOGRAPHIC CONTOUR (INTERVAL = 1 m)
- MINOR TOPOGRAPHIC CONTOUR (INTERVAL = 0.5 m)
- EXTENT OF TOPOGRAPHIC/BATHYMETRIC SURVEY (SEE REFERENCE 2)
- TAILINGS IMPOUNDMENT AREA ACCESS ROAD
- PIEZOMETER LOCATION

REFERENCES
1. SURFACE LEASE BOUNDARY FROM BARR ENGINEERING LTD. BASED ON TYPE A LAND USE PERMIT MV2019X0006, VALID TO 15 MAY 2024, MODIFIED BY GOLDER BASED ON 17 SEPTEMBER 2020 AMMENDMENT TO INCORPORATE LEASE BOUNDARY L-2000009T.
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RECEIVED: 2019-09-03 FROM TECK.

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ELEVATIONS SHOWN IN NAVD83

DATA INDICATES VWP IS DRY AT ELEVATION 195.22 m

CLIENT
TECK METALS LTD.

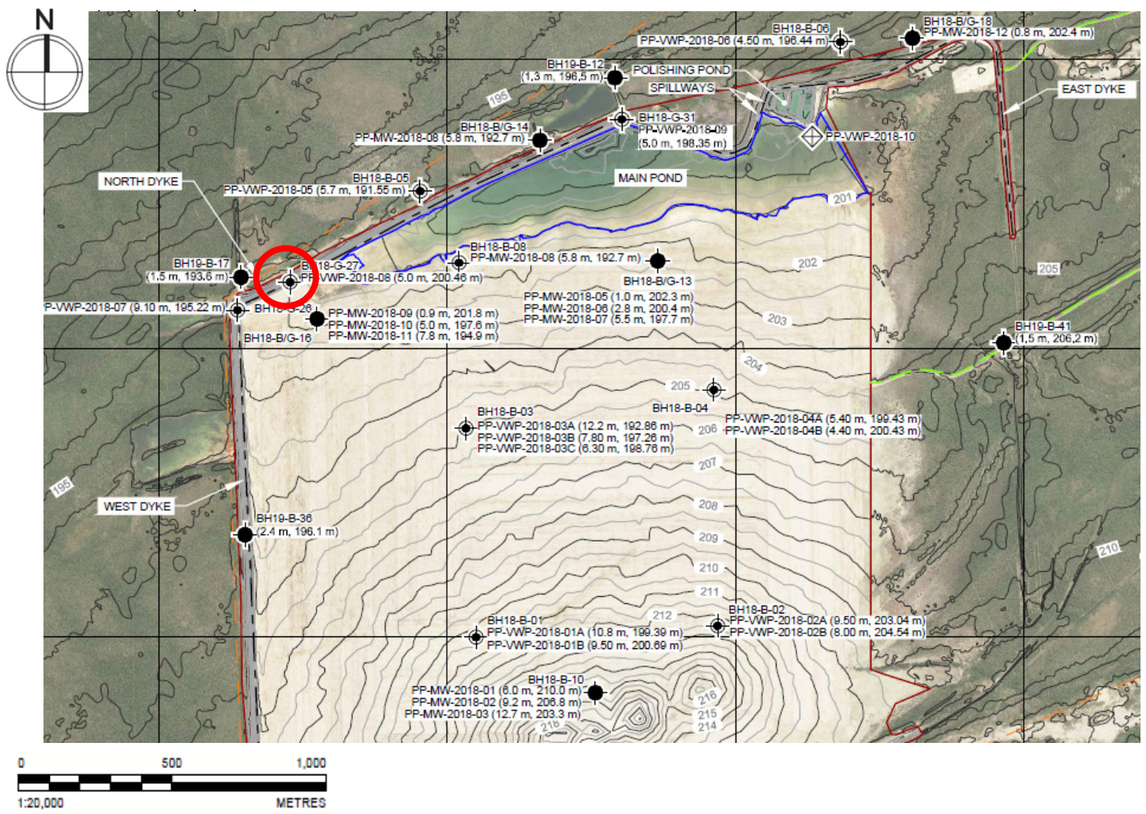
CONSULTANT
GOLDER

YYYY-MM-DD	2020-12-14
PREPARED	BHR
DESIGNED	BHR
REVIEWED	MBW
APPROVED	BEW

PROJECT
PINE POINT TAILINGS IMPOUNDMENT AREA
2020 ANNUAL INSPECTION
PINE POINT, NT

TITLE
BOREHOLE BH18-B-26
VIBRATING WIRE PIEZOMETER PP-VWP-2018-07

PROJECT NO.	PHASE/TASK/DOC	REV.	FIGURE
20140895	1000/1006/279	0	E-12



INVESTIGATION NAMING CONVENTION

BH18-B/G-01

- BH - BOREHOLE
- TYPE
- YEAR
- CONSULTANT: B - BARR; G - GOLDER; B/G - BARR AND GOLDER

PIEZOMETER INSTALL
PP-VWP-2018-02A (8.00 m, 10 m)

- PP - VIBRATING WIRE PIEZOMETER
- PINE POINT
- YEAR
- NUMBER
- (DEPTH OF TIP m, ELEVATION OF TIP m)

MONITORING WELL INSTALL
PP-MW-2018-02A (9.22 m, 16 m)

- MW - MONITORING WELL
- PINE POINT
- YEAR
- NUMBER
- (DEPTH TO TOP OF SCREEN m, ELEVATION OF TOP OF SCREEN m)

LEGEND

- BOREHOLE
- BOREHOLE WITH NESTED WELL
- BOREHOLE WITH PIEZOMETER
- MAIN POND PIEZOMETER
- APPROXIMATE DYKE CRESTS
- APPROXIMATE SURFACE LEASE BOUNDARY (SEE REFERENCE 1)
- EXTENT OF MAIN POND (SEE REFERENCE 2)
- MAJOR TOPOGRAPHIC CONTOUR (INTERVAL = 1 m)
- MINOR TOPOGRAPHIC CONTOUR (INTERVAL = 0.5 m)
- EXTENT OF TOPOGRAPHIC/BATHYMETRIC SURVEY (SEE REFERENCE 2)
- TAILINGS IMPOUNDMENT AREA ACCESS ROAD
- PIEZOMETER LOCATION

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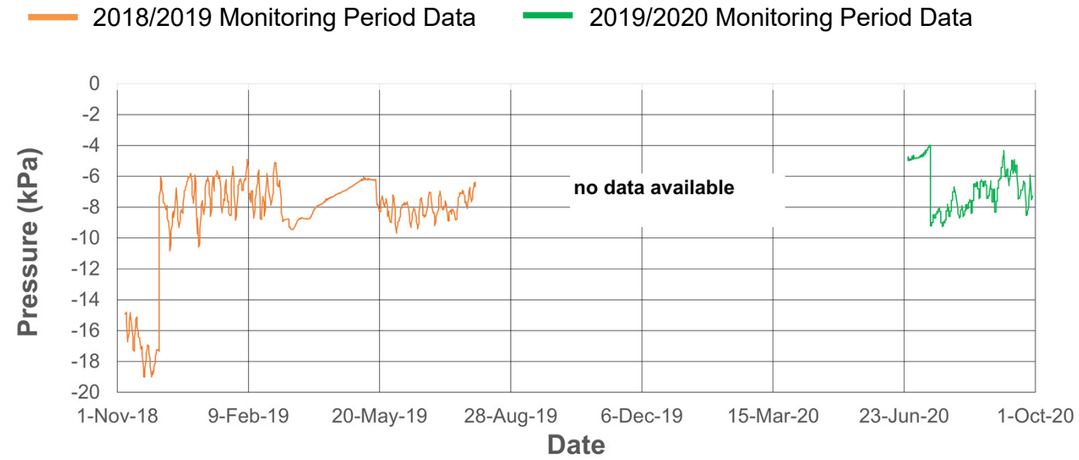
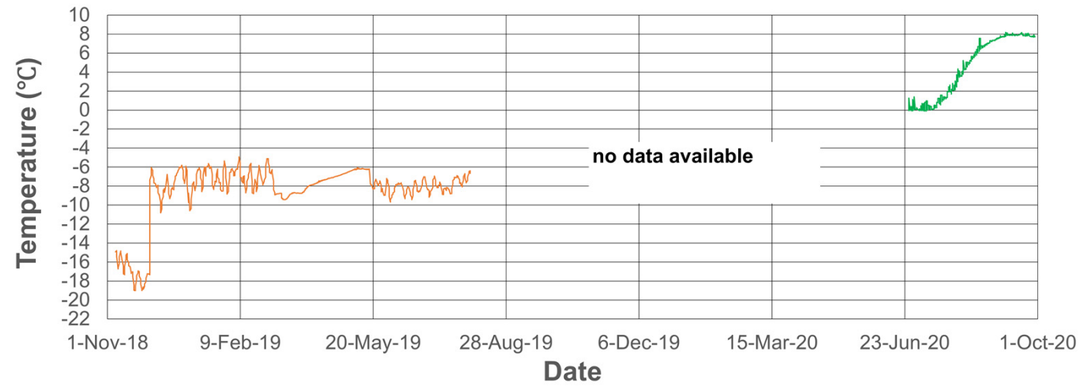
ELEVATIONS SHOWN IN NAVD83





DATA INDICATES VWP IS DRY AT ELEVATION 192.7 m

CLIENT
TECK METALS LTD.

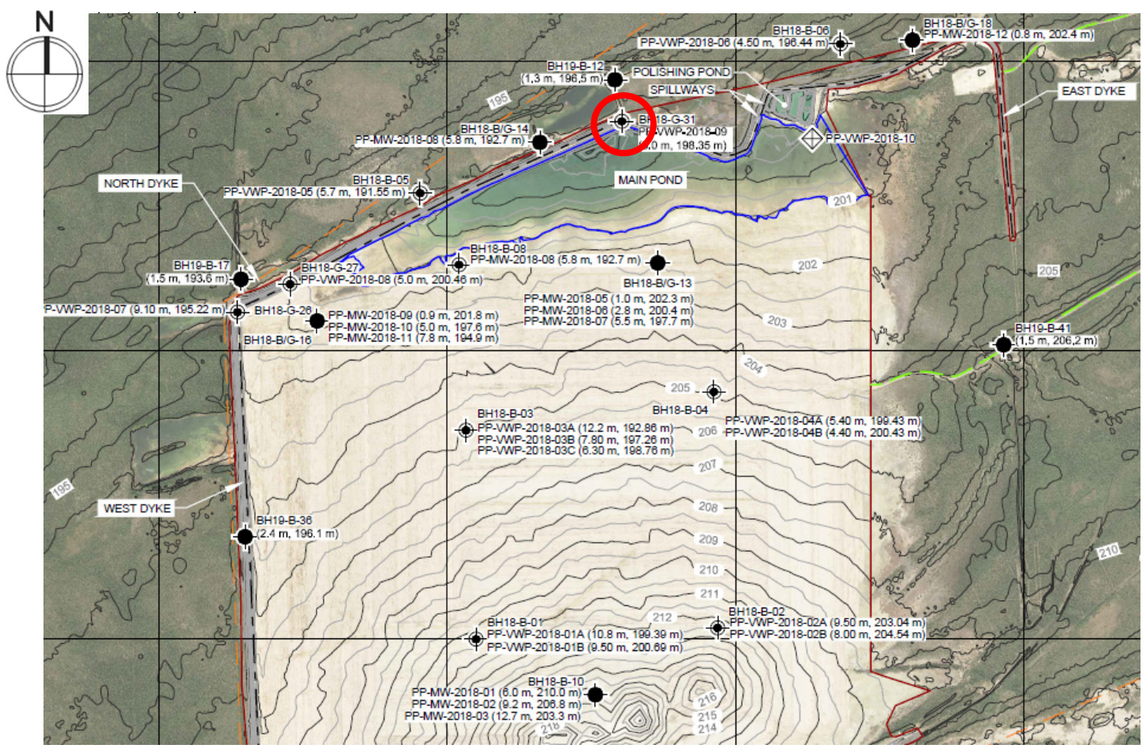
CONSULTANT
GOLDER

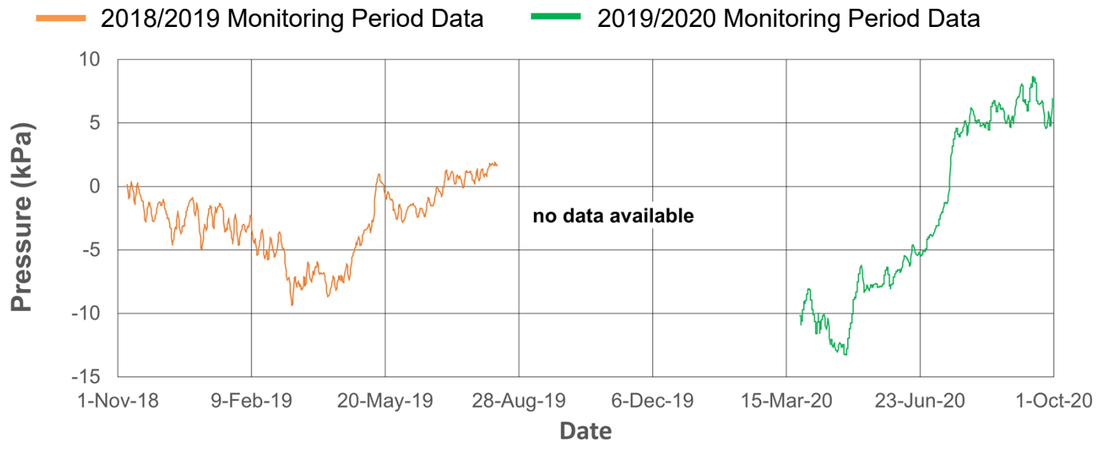
YYYY-MM-DD	2020-12-14
PREPARED	BHR
DESIGNED	BHR
REVIEWED	MBW
APPROVED	BEW

PROJECT
PINE POINT TAILINGS IMPOUNDMENT AREA
2020 ANNUAL INSPECTION
PINE POINT, NT

TITLE
BOREHOLE BH18-B-27
VIBRATING WIRE PIEZOMETER PP-VWP-2018-08

PROJECT NO.	PHASE/TASK/DOC	REV.	FIGURE
20140895	1000/1006/279	0	E-13





INVESTIGATION NAMING CONVENTION

BH18-B/G-01
- TYPE: BH - BOREHOLE
- YEAR
- CONSULTANT: B - BARR; G - GOLDER; B/G - BARR AND GOLDER

PIEZOMETER INSTALL
PP-VWP-2018-02A (8.00 m, 10 m)
- PINE POINT: VIBRATING WIRE PIEZOMETER
- YEAR
- NUMBER
- (DEPTH OF TIP m, ELEVATION OF TIP m)

MONITORING WELL INSTALL
PP-MW-2018-02A (9.22 m, 16 m)
- PINE POINT: MONITORING WELL
- YEAR
- NUMBER
- (DEPTH TO TOP OF SCREEN m, ELEVATION OF TOP OF SCREEN m)

LEGEND
- BOREHOLE
- BOREHOLE WITH NESTED WELL
- BOREHOLE WITH PIEZOMETER
- MAIN POND PIEZOMETER
- APPROXIMATE DYKE CRESTS
- APPROXIMATE SURFACE LEASE BOUNDARY (SEE REFERENCE 1)
- EXTENT OF MAIN POND (SEE REFERENCE 2)
- MAJOR TOPOGRAPHIC CONTOUR (INTERVAL = 1 m)
- MINOR TOPOGRAPHIC CONTOUR (INTERVAL = 0.5 m)
- EXTENT OF TOPOGRAPHIC/BATHYMETRIC SURVEY (SEE REFERENCE 2)
- TAILINGS IMPOUNDMENT AREA ACCESS ROAD
- PIEZOMETER LOCATION

REFERENCES

1. SURFACE LEASE BOUNDARY FROM BARR ENGINEERING LTD. BASED ON TYPE A LAND USE PERMIT MV2019X0006, VALID TO 15 MAY 2024, MODIFIED BY GOLDER BASED ON 17 SEPTEMBER 2020 AMMENDMENT TO INCORPORATE LEASE BOUNDARY L-2000009T.
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DATA INDICATES VWP IS DRY AT ELEVATION 198.35 m

INSTRUMENT REQUIRES CHECK FOR FUNCTIONALITY / CALIBRATION

NOTES:
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ELEVATIONS SHOWN IN NAVD83

CLIENT
TECK METALS LTD.

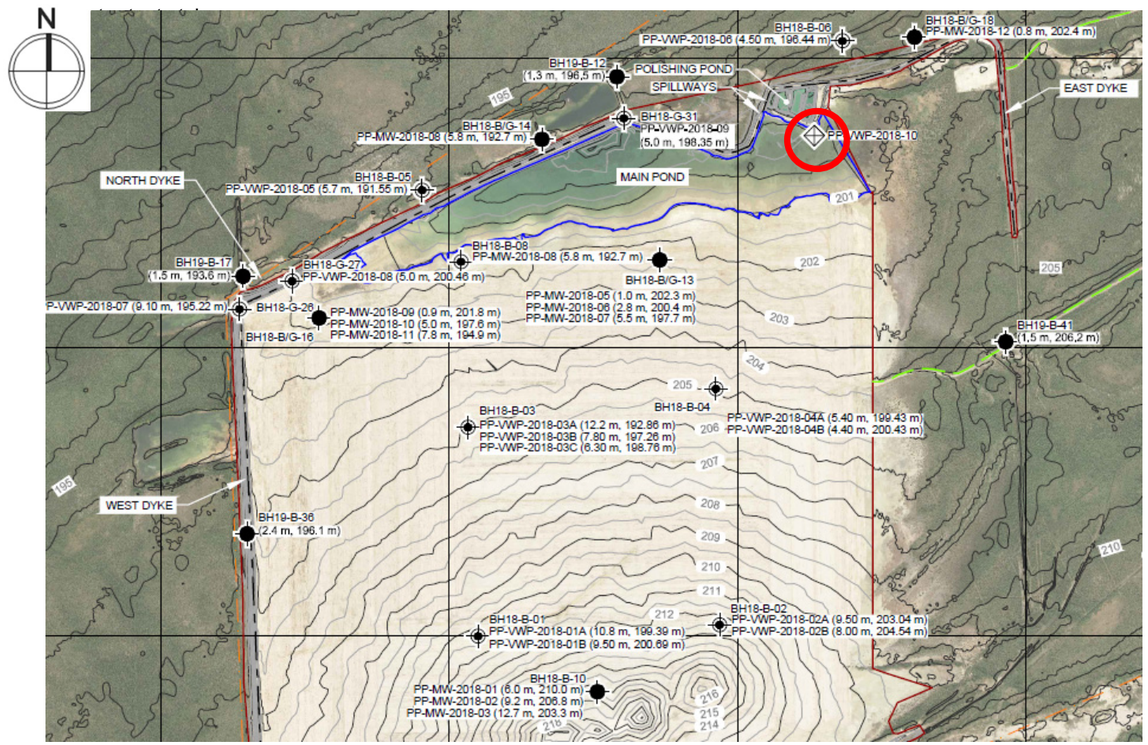
CONSULTANT
GOLDER

YYYY-MM-DD	2020-12-14
PREPARED	BHR
DESIGNED	BHR
REVIEWED	MBW
APPROVED	BEW

PROJECT
PINE POINT TAILINGS IMPOUNDMENT AREA
2020 ANNUAL INSPECTION
PINE POINT, NT

TITLE
BOREHOLE BH18-B-31
VIBRATING WIRE PIEZOMETER PP-VWP-2018-09

PROJECT NO.	PHASE/TASK/DOC	REV.	FIGURE
20140895	1000/1006/279	0	E-14



INVESTIGATION NAMING CONVENTION

BH18-B/G-01

- BH - BOREHOLE
- TYPE
- YEAR
- CONSULTANT: B - BARR; G - GOLDER; B/G - BARR AND GOLDER

PIEZOMETER INSTALL
PP-VWP-2018-02A (8.00 m, 10 m)

- PP - VIBRATING WIRE PIEZOMETER
- PINE POINT
- YEAR
- NUMBER
- (DEPTH OF TIP m, ELEVATION OF TIP m)

MONITORING WELL INSTALL
PP-MW-2018-02A (9.22 m, 16 m)

- PP - MONITORING WELL
- PINE POINT
- YEAR
- NUMBER
- (DEPTH TO TOP OF SCREEN m, ELEVATION OF TOP OF SCREEN m)

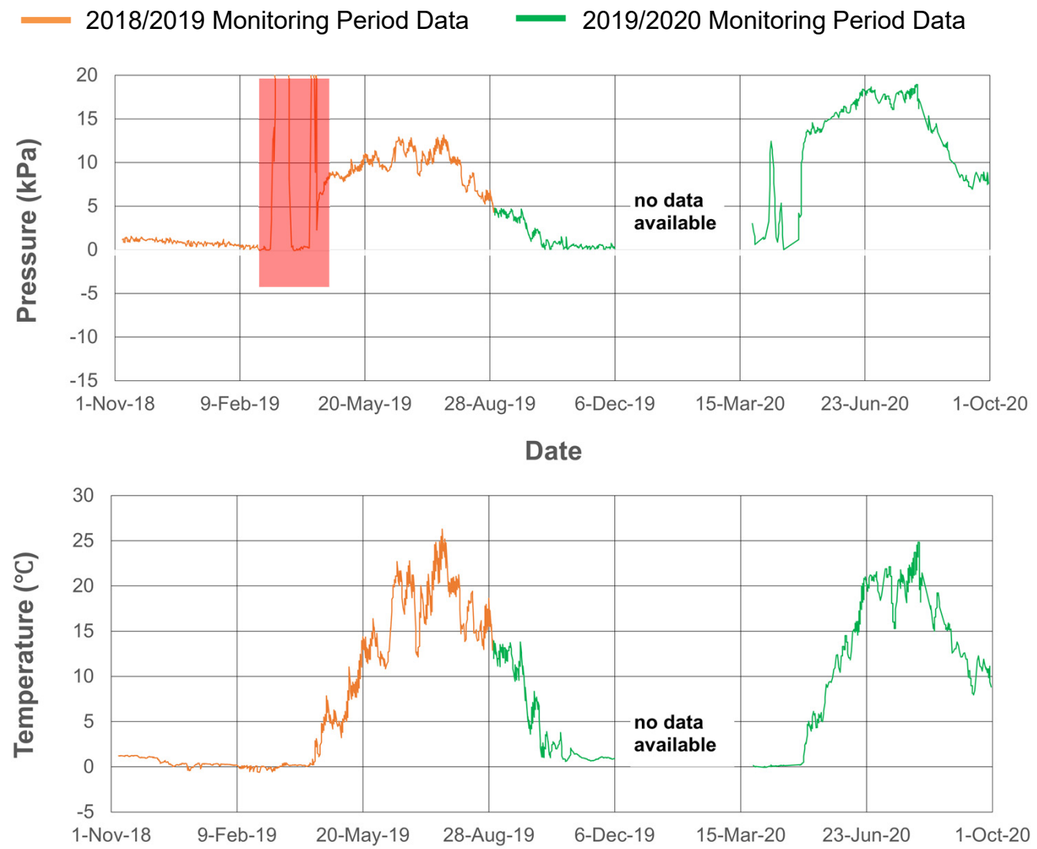
LEGEND

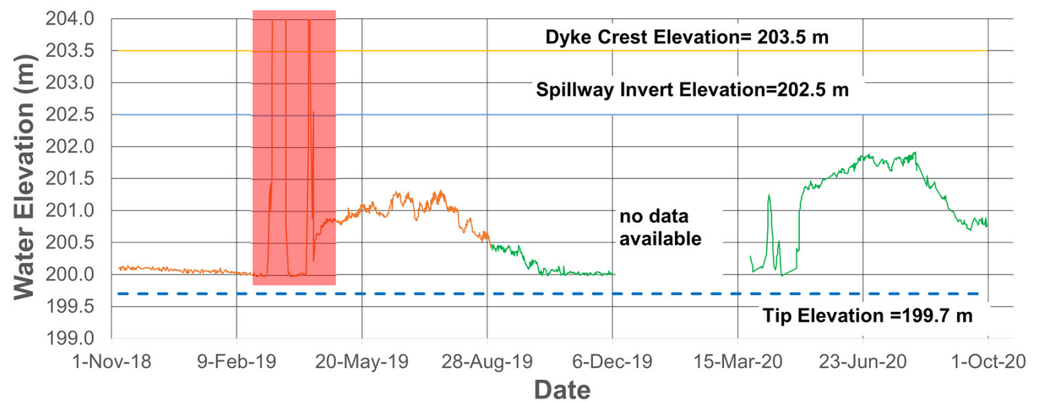
- BOREHOLE
- BOREHOLE WITH NESTED WELL
- BOREHOLE WITH PIEZOMETER
- MAIN POND PIEZOMETER
- APPROXIMATE DYKE CRESTS
- APPROXIMATE SURFACE LEASE BOUNDARY (SEE REFERENCE 1)
- EXTENT OF MAIN POND (SEE REFERENCE 2)
- MAJOR TOPOGRAPHIC CONTOUR (INTERVAL = 1 m)
- MINOR TOPOGRAPHIC CONTOUR (INTERVAL = 0.5 m)
- EXTENT OF TOPOGRAPHIC/BATHYMETRIC SURVEY (SEE REFERENCE 2)
- TAILINGS IMPOUNDMENT AREA ACCESS ROAD
- PIEZOMETER LOCATION

REFERENCES

1. SURFACE LEASE BOUNDARY FROM BARR ENGINEERING LTD. BASED ON TYPE A LAND USE PERMIT MV2019X0006, VALID TO 15 MAY 2024, MODIFIED BY GOLDER BASED ON 17 SEPTEMBER 2020 AMMENDMENT TO INCORPORATE LEASE BOUNDARY L-2000009T.
2. IMPOUNDMENT AREA TOPOGRAPHIC AND BATHYMETRIC SURVEY BY MASKWA ENGINEERING LTD., FILENAME: 18-034 Pine Point Tailings Topo Survey.dwg. SURVEY DATE: 2019-06-26, ORIGINAL SCALE 1:15,000. RECEIVED: 2019-08-12.
3. SURROUNDING AREA TOPOGRAPHIC SURVEY AND ORTHOPHOTO BY PHOTOSAT, FILENAME: pine_point_wo4077_survey.zip. SURVEY DATE 2019-07-14. RECEIVED: 2019-09-03 FROM TECK.

NOTES:
ATMOSPHERIC PRESSURE CORRECTION APPLIED TO VWP ELEVATIONS
RED SHADING INDICATES ERRORS ATTRIBUTED TO FREEZE/THAW
STAFF GAUGE LOCATED AT CULVERT INVERT TO POLISHING POND
PIEZOMETER TIP ELEVATION ASSUMED.
ELEVATIONS SHOWN IN NAVD83





CLIENT
TECK METALS LTD.

CONSULTANT
GOLDER

YYYY-MM-DD	2020-12-14
PREPARED	BHR
DESIGNED	BHR
REVIEWED	MBW
APPROVED	BEW

PROJECT
PINE POINT TAILINGS IMPOUNDMENT AREA
2020 ANNUAL INSPECTION
PINE POINT, NT

TITLE
MAIN POND
VIBRATING WIRE PIEZOMETER PP-VWP-2018-10

PROJECT NO.	PHASE/TASK/DOC.	REV.	FIGURE
20140895	1000/1006/279	0	E-15

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