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2020 Annual Report





Atlantic Gold

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2020 Annual Report

Touquoy Gold Mine

Atlantic Mining NS Inc.

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Submitted to:

Nova Scotia Environment and Climate Change
Inspection, Compliance and Enforcement
Bedford Regional Office
Suite 115, 30 Damascus Road
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Executive Summary

This 2020 Annual Report for the Touquoy Gold Project, together with the Stantec 2020 Annual Surface Water and Groundwater Monitoring Report (provided under separate cover) is intended to comply with Section 12c) of the Industrial Approval (hereafter referred to as “the IA”) (No. 2012-084244).

The major components of the Project include the Plant Site, Open Pit Mine, Tailings Management Facility (TMF), Waste Rock Storage Area (WRSA), and ancillary features including topsoil, organics and till stockpiles, and haul roads. The TMF comprises a tailings pond, an effluent treatment plant (ETP), a geo-tube sludge collection system, a polishing pond/spillway, a constructed wetland, perimeter ditching and seepage collection ponds.

Processing of Touquoy ore at the Plant Site and deposition of tailings into the TMF commenced on October 11, 2017, ramping up towards commercial production which was achieved in March 2018. Treated effluent discharge from the Final Discharge Point to the receiving environment (Scraggy Lake) commenced on July 20, 2018, triggering Metal and Diamond Mining Effluent Regulations (MDMER). Treated effluent was continually discharged to the receiving environment until July 2019. Effluent discharge was not conducted between August and December 2019 in order to maintain the minimum TMF pond operating levels. In 2020, effluent discharge began on March 20, 2020 and continued through until June 23, 2020. No effluent was deposited between June 23, 2020 and September 23, 2020 in order to maintain minimum operating pond levels in the TMF. Effluent discharge re-commenced on September 24, 2020 and continued throughout the remainder of 2020.

Surface water and groundwater monitoring were completed as required by the IA and Atlantic Mining Nova Scotia Inc. (AMNS) approvals and permits. The 2020 surface water and groundwater monitoring program generally met the requirements of the IA, with minor exceptions (missed samples) which are discussed in detail within the Surface Water & Groundwater Annual Report. Recommendations for improvements to the surface water and groundwater monitoring program, as well as recommendations for increased surveillance and further investigation were made based on the results of the 2020 program. Key recommendations include recommencing monitoring and sampling from the domestic 6749_OFFI well in 2021, postponing decommissioning of the domestic well 6719_HILC to coincide with house demolition, investigating potential safe control of aquatic vegetation at SW-11 to improve flow measurements (in consultation with NSE and Fisheries and Oceans Canada), completing quarterly reviews of dissolved copper concentrations at the plant site (PLM) wells, investigating the extent of groundwater effects in the southwest corner of the TMF (i.e. near TMW-12A/B and TMW 15A/B), investigating possible mitigation options to manage water quality in the vicinity of SW-15, conduct water quality modelling to evaluate the change in water quality in Watercourse #4 that may be associated with continued seepage from the WRSA, and consider adding wetland monitoring well MW15 to the water quality sampling program.

As previously reported to NSE, results of the ambient air quality monitoring found four total suspended particulate exceedances out of 41 samples collected over the seven-day sampling program. The report indicated that the exceedances occurred at two sampling locations (Location 2 and Location 3). Location 2 is situated approximately 100 m west from the open pit and Location 3 is situated near the middle of the mine site adjacent to Mooseland Road and the mine’s haul road crossing. Exceedances found at Locations 2 and 3 were determined to likely be the result of dust being generated from localized

sources, such as traffic on the haul road, haul road crossing and in the open pit area. There were no other exceedances of the TSP 24-hour objective at any of the other remaining locations. There were no exceedances for arsenic and mercury was not detected in any of the samples for all locations. AMNS will continue to use standard industry dust management practices on the haul road to minimize dust generation as recommended in the ambient air quality monitoring report.

During 2020, a total of 161 blast events occurred at the site. Blast monitoring was completed at two discrete locations during each blast with exceptions as reported to NSE. Monitoring results found that all parameters recorded fall within the acceptable blasting limits included in the IA for ground vibration and air concussion.

During 2020, a total of 2,785,406 tonnes of dry tailings were processed through the mill and deposited in the TMF. A total volume of 3,259,054 m³ of TMF recycle water and 139,231 m³ of fresh water were used for mill operations and a total of 1,641,669 m³ of treated effluent was discharged to Scraggy Lake in 2020. The average daily and total monthly volumes for the TMF inputs and outputs are reported in the attached appendices.

In 2020, 189 mine rock samples and 24 tailings samples were submitted for acid rock drainage (ARD) and/or metal leaching monitoring purposes. The results of these analyses indicate a slightly lower percentage of potentially acid generating (PAG) rock compared to 2019. Results continue to indicate that the stored waste rock material as a whole generally contains an excess in NP and therefore there is no immediate risk of ARD development.

A meeting was held with the mine's Independent Tailings Review Board (ITRB) in October 2020. A report prepared by the ITRB did not identify any areas of non-compliance or conditions which compromise TMF integrity. The ITRB concluded from its 2020 review that the overall stewardship of the TMF met its expectations of good practice.

AMNS had twelve reportable releases to the receiving environment during 2020. The reportable release incidents were considered to be minor and short term in nature and were followed up with the appropriate incident investigations, documentation, and corrective actions as required under applicable IA, provincial, and federal statutes.

Potential non-compliance events occurred during 2020. These events relate to various IA Conditions and include missed blast monitoring events, NSE audit findings, ambient air monitoring results and missed samples or readings. Many of the non-compliances were reported by AMNS to NSE upon discovery, and corrective actions have taken place. Further details are included in the report below.

AMNS continues to hold valid insurance for site pollution incident legal liability up to \$10,000,000. There have been no claims or notices against this policy.

A Community Liaison Committee (CLC) has been in place for the Touquoy Project since 2011 and was expanded in late 2016. During 2020, the CLC met two times for in person meetings, with an additional conference call held. Engagement of the Mi'kmaq of Nova Scotia is ongoing, with further details provided within this report.

During 2020, AMNS received four new community complaints. Two of these complaints were related to road conditions at the haul road crossing and Mooseland Road. A complaint received during a public engagement meeting included concerns about the use of remote cameras, the lack of an ATV by-pass

trail and the location of the silt curtain in Scraggy Lake. The final complaint received related to sediment entering an off-site watercourse near a contractor clay excavation site.

A resident living in Mooseland, who has made previous complaints to AMNS, continued to make occasional complaints regarding traffic speeding through their community. AMNS has reached out to this resident on each occasion it received a complaint using the established complaint resolution plan. Details of AMNS's activities to address the reported complaints are contained within.

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1 Introduction

The Touquoy Gold Project in Halifax County, Nova Scotia comprises a total area of approximately 271 hectares based on disturbance mapping provided in January 2021. Table 1, Appendix B shows the breakdown by project component. The major Project components include the Plant Site, Open Pit Mine, Tailings Management Facility (TMF), Waste Rock Storage Area (WRSA), and ancillary features including topsoil, organics and till stockpiles, and haul roads. The TMF comprises a tailings pond, an effluent treatment plant (ETP), a geo-tube sludge collection system, a Polishing Pond/spillway, a constructed wetland, and perimeter ditching and seepage pond system.

Processing of Touquoy ore at the plant and deposition of tailings into the TMF commenced on October 11, 2017, ramping up towards commercial production which was attained in March 2018. Release of treated tailings contact water to the receiving environment (Scraggy Lake) commenced on July 20, 2018. Effluent discharge was continued through until July 31, 2019. No effluent was deposited between July 31, 2019 and December 31, 2019. In 2020, effluent discharge began on March 20th, 2020 and continued through until June 23, 2020. No effluent was deposited between June 23, 2020 and September 23, 2020 in order to maintain minimum operating pond levels in the TMF. Effluent discharge re-commenced on September 24th, 2020 and continued throughout the remainder of 2020.

The Touquoy Gold Mine project began construction in June 2016. Construction activities continued throughout 2017 to 2020. Construction and operation activities for 2020 are summarized below:

- Open Pit Mine development and operation activities are summarized below:
 - Throughout 2020, the Phase 1 Open Pit was developed to an elevation of approximately 65 meters above sea level (masl) in January 2020, 60 masl from February to April 2020, 55 masl in May 2020, 50 m masl in June 2020, 45 masl from July to August 2020, 40 CGVD2013 ¹in September 2020, 36 masl in October 2020, 30 masl in November 2020 and 25 masl in December 2020.
 - The clay borrow source, located adjacent to the southeast corner of the Open Pit Mine, was expanded further southeast to support ongoing TMF construction activities and sediment collection pond construction.
 - The access road south of the Pit was moved southward to accommodate open pit development.
- TMF construction, development and operation activities were undertaken as summarized below:
 - Tailings pond dam raised to 128 masl.
 - Continuation of construction of the northwest seepage collection ditching.
 - Construction of the northern seepage collection ditching and commissioning of the northern collection pond – SW-22.
- Ancillary Infrastructure Construction and Development – sediment pond improvements were made at existing control points along the site access roads and haul roads, including:

¹ CGVD2013: Canadian Geodetic Vertical Datum of 2013.

- Collection pond constructed at the Haul Road Crossing south of Mooseland Road.
- Engineering and construction of an enlarged sediment collection pond along the Waste Rock Haul Road.
- Scraggy Lake Overburden Stockpile ditching system was engineered and constructed, including a perimeter ditch along the eastern, western and southern boundaries of the stockpile draining to a collection pond located on the southeast corner of the stockpile.

The following sections are included in the annual report based on IA requirements:

- Reportable Releases and Non-Compliances
- Surface Water and Groundwater;
- Air Quality;
- Blasting Monitoring;
- Mill and Tailings Management Activities;
- Mine Rock Geochemistry;
- Rain Event Monitoring;
- Erosion and Sediment Control Efforts;
- Insurance Requirements; and
- Community Consultation and Engagement.

Site plans showing the general site location, site layout and infrastructure are provided in Drawings 1 and 2, Appendix A.

2 Reportable Releases and Non-Compliances

2.1 Reportable Releases

AMNS had twelve reportable releases in 2020. Incident investigations and follow-up corrective actions were undertaken to respond to these occurrences. The twelve reportable releases were reported to Nova Scotia Environment and Climate Change (NSE) via standardized reports and are summarized in Table 2 below.

Table 2 – Summary of 2020 Reportable Releases.

Incident Date	Spill / Incident Location	Spill Material	Spill Quantity
2020-04-27	Watercourse #4, TMF Haul Road Culvert B upstream	Silt	6.5 m ³
2020-04-28 (ongoing from 2020-04-27)	Watercourse #4, TMF Haul Road Culvert B upstream	Silt	4.5 m ³
2020-06-13	Watercourse #4, Waste Rock Haul Road Culvert A downstream	Silt	Unknown
2020-09-15	Mill pad adjacent to CIL tanks	Tailings Slurry	~0.5 m ³
2020-10-14	Watercourse #4, TMF Haul Road Culvert B upstream	Silt	0.5 m ³ – 1.0 m ³
2020-10-14 (ongoing from earlier on 2020-10-14)	Watercourse #4, TMF Haul Road Culvert B upstream	Silt	0.75 m ³ – 1.0 m ³
2020-11-02	Watercourse #4, TMF Haul Road Culvert B upstream	Silt	~0.064 m ³
2020-11-16	Watercourse #4, TMF Haul Road Culvert B upstream	Silt	~0.49 m ³

Incident Date	Spill / Incident Location	Spill Material	Spill Quantity
2020-11-24	Scraggy Lake – Northwest corner	Discoloured water	Unknown
2020-12-21	Watercourse #4, TMF Haul Road Culvert B upstream	Silt	Unknown
2020-12-29	Watercourse #4, TMF Haul Road Culvert B upstream	Silt	0.56 m ³
2020-12-31	Watercourse #4, TMF Haul Road Culvert B upstream	Silt	0.324-0.602 m ³

Nine of twelve reportable releases for 2020 occurred at the same location (sediment release at TMF Haul Road Culvert B upstream). As a result of the repeated sediment events at TMF Haul Road Culvert B between April and December, an independent erosion and sediment control expert from Stantec Consulting Ltd. (Stantec) was retained to provide erosion and sediment control support. Immediate mitigative actions were taken at the time of each event including additional pumping operation to manage contact water on the TMF Haul Road, installation of clay plugs on the road surface, and establishing operating limits for the adjacent Emergency Containment Pond and ditch to rule out those structures as potential sources. As part of long-term corrective actions, Stantec has redesigned the TMF Haul Road to reduce the potential of silt runoff from entering Watercourse #4. Construction of the redesigned TMF Haul Road is scheduled to be completed in spring 2021. For further details, see Section 8.2 Erosion and Sediment Control Efforts.

Mitigative actions following the sediment release at Waste Rock Haul Road Culvert A downstream in June included the placement of additional fine-grained material along the Haul Road berm for improved control of surface runoff and additional controls related to road maintenance activities. The Mine team established a restricted work zone area in the vicinity of the watercourse crossing. This consisted of a 50 metre buffer on both sides of the culvert where no earthworks or grading activity can take place without the approval of Mine Management to ensure that the surface water control requirements for this area are maintained.

Following the loss of process control event in September that occurred at CIL Detox Tank 1, several mitigative actions were completed. Tailings slurry that was released to the Mill Pad was removed and placed back into the concrete containment area where a sump washes slurry back into the tank.

On November 24, 2020, an input of brown discolored water was observed flowing in a drainage channel and inputting into the northwest corner of Scraggy Lake. It was uncertain at the time of the event whether the input contained elevated sediment or if the coloration was due to naturally occurring organic content/tannins from upstream wetlands. Analytical results received following the November 24, 2020 event were deemed acutely lethal. Total Suspended Solids (TSS) concentrations were within acceptable levels as outlined in Condition 15(d) of the IA. Following receipt of the acutely lethality laboratory results, AMNS retained the assistance of independent technical experts from Stantec, Lorax Environmental (Lorax) and Intrinsic Corp (Intrinsic) to review relevant water quality data to support investigation into the cause of the event. Lorax’s review indicated that the water quality observed in the drainage channel is likely not affected by flow contributions from the TMF or WRSA seepage. Stantec reported the water quality from the drainage channel sample indicates the potential discharge from a bog. Further field investigation was also completed, including additional sampling and pH readings. After review of the toxicity results by Intrinsic, pH is considered to be the factor with the highest potential for influencing the potential toxicity of the drainage sample. Intrinsic noted that pH appears to be within natural levels within the drainage channel. Potential sources of sediment were also investigated. This included a public access road and nearby trail and the TMF overburden stockpile

which are all located upstream of the drainage channel. Although the results of this investigation were inconclusive, AMNS completed additional mitigative actions in response to the event. An inspection of the TMF Overburden Stockpile was completed marking any rilling locations along the west side of the top of the stockpile. As a precautionary measure clay was placed at targeted locations on the top of the stockpile to reduce runoff and silt fencing was placed in an area where runoff along the western slope of the stockpile was observed. An attempt to further stabilize the TMF Stockpile with hay mulch in December 2020 was unsuccessful due to contractor equipment breakdowns and high wind conditions. The contractor returned and applied hay mulch to all accessible areas of the TMF Stockpile in March 2021.

2.2 Potential Non-Compliances

2.2.1 Summary of Potential Non-Compliances

Potential non-compliances with the IA were identified in 2020. Further details are included below.

AMNS provided notification to NSE of missed blast monitoring events for the 2020 calendar year on November 13, 2020 and March 16, 2021. A total of seven blasts were not monitored at the “Cabin in the Woods” location, the compliance point as prescribed in the IA. These blasts could not be monitored because of impassable roads due to either snow fall or lightning in the area. Four of these blasts were able to be monitored at an alternative location (Higgins Mines RD Pit), which is closer to the open pit than the “Cabin in the Woods” location and considered to be a more conservative monitoring location. No exceedances in blast limits were observed. One additional blast monitoring event was reported to NSE where the secondary blast monitoring location used by AMNS (7212 Moose River Rd) was not monitored, however, this blast was monitored at the compliance point (Cabin in the Woods). As a result of these missed events, AMNS has updated the “Blasting Procedure” SOP to include a 24 hour notification to ensure missed monitoring events are reported without delay. In addition, AMNS worked collaboratively with NSE to develop a plan to report missed events during the routine monthly meetings.

The 2020 Ambient Air Monitoring Program (AAMP) results were reviewed in late 2020 and four total suspended particulate (TSP) exceedances were identified at two sample locations. NSE was notified of the exceedances via email on November 18, 2020. The sample locations with TSP exceedances are situated in operational areas, with one location situated near the open pit (Location 2) and the second location adjacent to the haul road crossing on Mooseland Road. AMNS will continue to use standard industry dust management practices on the haul road to minimize dust generation as recommended in the AAMP report.

As part of an IA revision issued to AMNS on April 9, 2020 (2012-084244-06), a Condition was added requiring installation of groundwater monitoring wells at the Scraggy Lake overburden stockpile within 45 days of issuance of the Approval (May 24, 2020). The wells (SSP 1 – 3 A&B) were not able to be installed until June 16, 2020 or 23 days after the date prescribed in the IA. IA Condition 8 (a)(viii) required analytical results within 75 days of issuance of the IA revision. Samples were collected on June 18, 2020 and partial analytical results were provided on the due date of June 23, 2020.

An additional IA revision issued on April 9, 2020 required all contact water from the Scraggy Lake overburden stockpile area to be pumped to the TMF. Previous versions of the IA had excluded this stockpile area from the surface water management requirements. NSE informed AMNS during a

monthly meeting in June 2020 that AMNS would be considered non-compliant with management of contact water at this area until additional infrastructure was put in place to manage the water. Preparatory work for the additional infrastructure was initiated in late 2019 and continued throughout early 2020, including ditch and pond engineering/design, tree clearing, and preparation of a project specific sediment and erosion control plan. Construction of the collection pond and perimeter ditching system commenced on August 21, 2020 and was complete October 30, 2020, as reported to NSE via email. Ditch construction was completed on the west, east and south sides of the stockpile to redirect runoff contacting the stockpile to the collection pond. A six-inch diesel pump is stationed at the collection pond to direct water to the pit, where it is subsequently pumped to the TMF.

The IA revision issued on April 9, 2020 also included a requirement to implement the recommendations from the “Scraggy Lake Overburden Stockpile Assessment” report prepared by Stantec Consulting Ltd., including runoff sampling during rainfall events in 2020. AMNS completed the additional monitoring, and results were reported by Stantec on December 31, 2020, as prescribed by the IA. NSE issued a document review letter to AMNS on February 23, 2021, outlining missed samples. AMNS provided a response document with further rationale as to why some of these samples were not able to be collected or not required (e.g. sampling locations were dry or no longer present) to NSE on March 31, 2020. NSE’s letter noted a delay in reporting of the missed samples. In follow-up, AMNS and NSE developed a plan to report missed samples during the routine monthly meetings.

NSE completed an IA audit in 2020, initiated with an information request issued to AMNS on August 12, 2020, followed by a site visit on August 30, 2020. Following review of the document package and site visit findings, NSE issued AMNS an Audit Report on November 10, 2020. The audit findings included in the report identified historic non-compliances for which enforcement action has not occurred. The report also noted additional potential non-compliances identified during the audit. AMNS provided a response document to NSE with further information to address NSE’s questions for the potential non-compliances and other audit findings on December 10, 2020, and continues to work with NSE to provide further information and implement further improvements (including an April 30, 2021 audit response submission).

Other items of note for calendar year 2020 include occasional missed samples and readings from the routine monitoring program. This includes missed groundwater monitoring and sampling events due to frozen groundwater wells, missed surface water samples due to unsafe road and trail conditions, as well as omitted pH readings due to lack of water in the pit sump. During a meeting held between AMNS and NSE on March 4, 2021, a plan was mutually developed to ensure all missed samples and readings are reported at the time they are missed rather than in the annual report as was the previous format used by AMNS. Therefore, going forward all future missed samples and readings are reported during the routine monthly meeting and documented within the meeting minutes as discussed.

2.2.2 Reportable Release Events and Non-Compliance Closure

In terms of adverse impacts to the receiving environment, the actual consequences of the releases and non-compliances detailed in the sections above are considered to be negligible or minor and reversible. AMNS follows up each incident with a robust incident investigation report that outlines basic causes and recommended corrective actions. The corrective actions are tracked by each department and closed off once completed. The Environment Department has oversight of this process. AMNS is committed to working collaboratively with NSE to improve our reporting of missed samples or readings.

3 Surface Water and Groundwater

Surface water and groundwater monitoring is required under the IA in Conditions 7 and 8. The results of the groundwater and surface water monitoring program are presented in detail in the annual report as per Condition 12c) and 12d). In response to the above IA requirements, periodic monitoring for water quality and quantity was completed at the site by qualified personnel. The results and interpretation of the 2020 surface water and groundwater monitoring are presented in Appendix C.1 (provided electronically as separate file due to file size) in the following report:

- 2020 Annual Report – Surface Water and Groundwater Monitoring Touquoy Gold Project. Prepared by Stantec Consulting Ltd. (Stantec), April 30, 2020.

To assess the effects of construction and mine operation on groundwater and surface water, the 2020 surface water and groundwater analytical results were compared to the relevant baseline conditions established from the monitoring conducted in 2016 and 2017, water quality predictions, and IA specified criteria (Appendix K of IA) and contingency plan action levels. Interpretation of the results of the surface water and groundwater monitoring is detailed in Section 4.0 of the report (Appendix C.1).

The Stantec (April 2021) report documents the surface water and groundwater conditions during 2020. General report findings are summarized below:

- The depressed groundwater table at OPM-2A/B first reported in the 2019 Annual Report was observed to continue in 2020. The depressed water table appears to have a minor influence on stream flows in Moose River during the low-flow period. This effect is attributed to the interception of groundwater in the open pit that would have otherwise discharged to Moose River. Additional investigations were conducted in 2020, including the characterization of fish habitat in Moose River, continued monitoring of stream flows, and updating the groundwater flow modelling to quantify the volume of groundwater intercepted during mean annual and mean summer conditions. The reductions in flow rates in Moose River are greater than the dewatering rates from the open pit, and therefore cannot be solely attributed to baseflow reductions to Moose River associated with the open pit. Uncertainty in flow measurements at the upstream station SW-11 due to aquatic vegetation, and heavy evapotranspiration losses in the summer months may account for a portion of the additional flow reductions observed at SW-2. Project-related effects to surface water flows are predicted to be less than 5%, therefore no adverse effects to the aquatic environment are identified.
- Water quality in Moose River at SW-2 is consistent with the background water quality (SW-11 and SW-1). The water quality in Moose River does not appear to be affected by operations at the Site.
- Surface water quality above predictions was noted in upstream surface water monitoring stations in Watercourse #4 (SW-19, SW-23). Surface water quality at SW-23 above these predictions was not attributed to tailings seepage or mine site effluent.
- The source of the elevated sulphate and metals in the southwest corner of the WRSA and the northwest corner of the TMF were investigated in 2020, and appear to be due to seepage or contact water from the WRSA. Although water quality associated with sulphate does not

exceed any water quality guidelines, it may indicate the potential for other water quality parameters associated with the waste rock runoff or seepage to migrate toward Watercourse #4. The water quality at SW-WRSP1 indicates the potential for elevated nitrate, arsenic, cadmium, iron, and manganese in seepage from the WRSA to Watercourse #4. It is recommended that water quality modelling be conducted to evaluate the change in water quality in Watercourse #4 that may be associated with continued seepage from the WRSA to Watercourse #4. It is recommended that water quality in wetland monitoring well MW15, located in Wetland 15, also be monitored. This sampling should include the list of parameters from the IA, sampled on a quarterly basis

- The discharge from the FDP at SW-14 began in July 2018, and consistently discharged at concentrations less than the MDMER discharge limits. Although the water quality at SW-14 exceeded criteria contained within Column C, Table 6 in Appendix K of IA 2-12084244-08 for several parameters, it did not exceed the MDMER limits, or impair the downstream water quality in Scraggy Lake, as measured at SW-13.
- Increasing trends were observed for several indicator parameters (arsenic, cobalt, copper, ammonia, sulphate, conductivity, sodium, and chloride) at various groundwater wells across the site triggering additional surveillance activities. All wells were noted to be below action levels, with the exception of arsenic at one well (WRW-5B), copper at two wells (a plant site well and open pit well OPM-3A), total ammonia at three wells (TMW-7A and TMW15A/15B), and sulphate at five wells (along the northwest side of the TMF - TMW-11A/B, TMW-10A/B and TMW-12A).

The 2020 surface water and groundwater monitoring program generally met the requirements of the IA. Occasional water quality samples were omitted due to safety or access concerns at the surface water stations or wells, or due to frozen conditions.

Recommendations for improvements to the surface water and groundwater monitoring program, as well as recommendations for increased surveillance, were made based on the results of the 2020 program. Key recommendations include recommencing monitoring and sampling from the domestic 6749_OFFI well in 2021, postponing decommissioning of the domestic well 6719_HILC to coincide with house demolition, investigating potential safe control of aquatic vegetation at SW-11 to improve flow measurements (in consultation with NSE and Fisheries and Oceans Canada), completing quarterly reviews of dissolved copper concentrations at the PLM wells, investigating the extent of groundwater effects in the southwest corner of the TMF (i.e. near TMW-12A/B and TMW 15A/B) and investigating possible mitigation options to manage water quality in the vicinity of SW-15, conduct water quality modelling to evaluate the change in water quality in Watercourse #4 that may be associated with continued seepage from the WRSA and consider adding wetland monitoring well MW15 to the water quality sampling program.

In addition to the supporting information provided in the attached report, AMNS maintains on site records for the surface water and groundwater monitoring program, including surface water flow data, data logger readings, monitoring well elevations, and groundwater and surface water quality, for the duration of the Approval. As per the IA Condition 12c) ii), these records will be made available to NSE upon request.

4 Air Quality

Ambient air quality monitoring for dust (i.e., total suspended particulate) is required under the IA in Condition 4c). The IA requirements include annual monitoring (during July and August) at six monitoring stations throughout construction, operation, and reclamation (including periods of facility dormancy). Results of this particulate emission monitoring are to be submitted with the annual report.

In response to the above IA requirements, an ambient air sampling program was conducted from August 6 to August 14, 2020. While the program is required to run July-August as per Condition 4.c.ii, permission was granted by NSE via an email dated July 16, 2020 to move the program one week due to contractor availability. The results of the 2020 ambient air quality monitoring are presented in Appendix C.2 in the following report:

- 2020 Ambient Air Quality Monitoring Program, Touquoy Gold Project, Moose River, Halifax County, NS. Prepared by Wood Environment & Infrastructure Solutions, April 2021.

Results of the ambient air quality monitoring found four total suspended particulate exceedances out of 41 samples collected over the seven-day sampling program. The report indicated that the exceedances all occurred at two sampling locations (Location 2 and Location 3). Location 2 is situated approximately 100 m west from the open pit and location 3 is situated near the middle of the mine site adjacent to Mooseland Road and the mine's haul road crossing. Exceedances found at Locations 2 and 3 were determined to likely be the result of dust being generated from localized sources, such as traffic on the haul road, haul road crossing and in the open pit area. There were no other exceedances of the TSP 24-hour objective at any of the other remaining locations. A review of the arsenic results determined there are no exceedances and mercury was not detected in any of the samples for all locations.

AMNS acknowledges that there is a discrepancy in locations TSP 2 and TSP 3 between what has previously been reported in the AAMP reports and the sample locations provided in Appendix A in the IA. Sample "TSP 2" as noted in the IA is actually listed as "TSP 3", while sample "TSP 3" as noted in the IA is actually listed as "TSP 2". This discrepancy has been noted in the 2020 AAMP and going forward these locations will be revised to match the Locations in the IA.

The AAMP report recommended continued use of standard industry dust management practices on the haul road to minimize dust generation. The remoteness of the site and lack of infrastructure, such as readily available electricity, has presented challenges in the past for executing the ambient air sampling program. The AAMP report recommended considering passive sampling equipment to supplement the program. AMNS is currently reviewing the options available for this type of sampling equipment. The final recommendation of the AAMP report is the inclusion of additional blanks within the sampling program.

In 2020, dust suppression operation continued with the use of granular magnesium chloride, and with the application of water as temperatures permitted. In addition, a truck sweeper was utilized along the Mooseland Road to minimize dust re-entrainment along the asphalt surfaces.

In addition to the above monitoring as per the IA, no air quality complaints related to mine generated dust were noted by members of the public in 2020.

5 Blasting Monitoring

Blast monitoring for air concussion and ground vibration is required under the IA in Condition 11d). The IA requirements include monitoring during all blasting events at monitoring stations at the nearest structure not located on the site. A summary of the results of this blasting monitoring is to be submitted with the annual report.

During 2020, a total of 161 blast events occurred within the Open Pit Mine (Table 3, Appendix B). Two locations were selected to monitor conditions during the 2020 blasting events:

- 7212 Moose River Road (approximately 2800 m from the pit); and
- Cabin in the Woods (off Higgins Mines Road) approximately 1460 m from the pit.

As permission was not granted for monitoring to be completed within 7m of the structures at these locations, a public location nearest the structure in the direction of blast was selected as the compliance sampling point. The nearest structure not located on the site (Cabin in the Woods) was monitored during the blast events.

While the IA specifies blast monitoring is required only at the closest structure not located on site, AMNS currently conducts blast monitoring at two locations. The location identified as “Cabin in the Woods” is the nearest structure to the site as specified in IA Condition 11. The second monitoring station (“7212 Moose River Road”) is monitored as an additional location.

The monitoring station at the Cabin in the Woods was monitored during all blasts, with the exception of seven blasts (blast numbers 19-153-070-34, 20-153-070-01, 20-153-070-02, 20-153-070-T01, 2020-050-T01, 20-153-080-03 and 20-153-060-T09). The missed blasts were reported to NSE via email on November 13, 2020 and on March 16, 2021. Four of the blasts were not monitored at the Cabin in the Woods as the location was inaccessible due to snow cover. An alternate location was used for these blasts (Higgins Mine RD pit), which is located closer to the Touquoy Open Pit than the Cabin in the Woods and is considered to be a conservative alternate monitoring location.

Three blasts were not monitored due to lightning activity in the area. The blast monitoring contractor was unable to set up before the blast. One of the three blasts was monitored at the alternate location (7212 Moose River Road) on this day. The results from the alternate location were consistent with historic data and did not exceed the IA prescribed blasting limits for concussion and ground vibration. The remaining two blasts were not monitored at either location as the contractor was unable to set up before each blast.

Blast number 20-153-060-13 was not monitored at the alternative location (7212 Moose River Road), as the seismograph did not trigger. However, the blast was monitored at the compliance point at the Cabin in the Woods location and therefore meets IA requirements.

In summary, while seven blasts were not monitored at the compliance point (Cabin in the Woods), four of these blasts were monitored at a more conservative location located closer to the open pit (Higgins Mine RD pit). Two of the remaining three blasts could not be monitored due to a lack of time to set up

equipment as there was an active lightning warning and the mine's safety requirement is to blast as soon as possible during lightning events. The final blast was monitored at the alternative location.

In response to the missed monitoring events, AMNS's SOP "Blasting Procedure" has been updated to include a 24 hour notification to ensure missed monitoring events are reported to NSE without delay. Going forward, any changes to monitoring locations will be reported to NSE during the regular monthly meetings held between NSE and AMNS. Any missed blast monitoring will be reported without delay to NSE.

Monitoring results (displayed in Table 3, Appendix B) indicated that all parameters recorded at 7212 Moose River Road and the Cabin in the Woods fall within the acceptable blasting limits included in the IA for ground vibration (12.5 mm/s) and air concussion (128 dBL).

6 Mill and Tailings Management Activities

The TMF entered active operation on October 11, 2017 and was in continual operation throughout 2018, 2019 and 2020.

6.1 TMF Inputs and Outputs

In fulfillment of IA Condition 17 f) (i) and (ii), the average daily and monthly total tailings volumes and mass, mine water, recycled tailings water and freshwater makeup were recorded. Additional details on freshwater usage are documented in a separate report entitled "Approval #2017-103502-02: Water Withdrawal, Scraggy Lake, Monitoring and Reporting Requirements" dated April 26, 2021.

Effluent Treatment Plant (ETP) operations commenced on July 20th, 2018 with discharge to Scraggy Lake (the receiving environment) via a constructed wetland. The mine became subject to MDMER regulations at this time. Treated effluent was continually discharged to the receiving environment until July 2019. Effluent discharge was not conducted between August and December 2019 in order to maintain the minimum TMF pond operating levels. ETP operations continued in 2020 from March to June 2020, and from September through December 2020, with only brief shutdowns for maintenance. A total of 1,641,669 m³ of treated effluent was discharged to Scraggy Lake in 2020. The ETP was not operated between June 2020 and September 2020 in order to maintain minimum operating levels within the TMF pond for process water recycling use at the Plant.

The daily averaged volumes and masses are presented in Table 4, Appendix B, and the monthly total volumes and masses are presented in Table 5, Appendix B. During 2020, a total of 2,785,406 tonnes of dry tailings were processed through the mill and deposited in the TMF. A total volume of 3,259,054 m³ of TMF recycle water and 139,231m³ of fresh water (from Scraggy Lake) were used for mill operations in 2020.

AMNS continued to conduct regular inspections of the TMF seepage ponds throughout 2020. These inspections include daily monitoring of water levels throughout the year to determine pumping

requirements. While it is not possible to directly measure seepage flow into the ditches, seepage pond dewatering volumes have been measured via flow meters installed on the pumping infrastructure. These dewatering volumes include seepage from the TMF as well as surface runoff, inflow from natural wetland areas surrounding the TMF, and groundwater inflow. Using the available flow meter data, dewatering rates were calculated for the period of January 2 to December 31, 2020 and are presented in Table 6, Appendix B.

6.2 TMF Inspection and Capacity Review

To comply with regulatory requirements (including Condition 16d of the IA) as well as AMNS's internal policies on dam safety, semi-annual dam safety inspections (DSI) of the TMF are required to be completed. The TMF Engineer of Record (EOR) of Stantec Consulting Ltd. (Stantec) conducted a DSI of the TMF on and June 11, 2020 and December 7, 2020. The DSI's are in accordance with the guidelines of the Canadian Dam Association (CDA). The DSI reports are presented in Appendix C.3.

The dam safety inspections carried out by Stantec did not note any evidence of crest settlement, slope instabilities or excessive seepage at the Touquoy Facility. The inspections did not find any issues concerning the overall safety of the Tailings Dam, Polishing Pond Dam, and Wetland Berm. As part of the semi-annual DSI's Stantec has made several observations that resulted in recommendations.

Six recommendations were made during the June 2020 DSI. One recommendation was not completed involving the direction of flow coming from engineered wetland that is scouring beneath the pumphouse. This was not completed due to concerns of causing a siltation event with working in close proximity to Scraggy Lake.

Seven recommendations were made during the December 2020 DSI. Three recommendations remain in progress and have varying timeframes in 2021. In progress recommendations include; localized regrading will be required to direct runoff towards the seepage collection ditch (2021), piezometer cables to be extended as required with dam construction to allow for measurements to be collected from a safer location (Spring 2021), and removal of woody debris particularly around the polishing pond intake structure (Q1 2021).

Recommendations completed following the DSI's include adding rip rap to geobag discharge collection ditch, completion of eastern portion of seepage ditch, monitoring of downstream slope of east TMF dam, repair road materials and grades in emergency spillway, and maintain general site conditions.

As required by Condition 16 e) of the IA, dam safety reviews (DSRs) are conducted twice during the life of the Project; the first DSR is anticipated to be completed in 2021.

With reference to Condition 17 (g) of the IA, the EOR has confirmed the current and forecasted capacity of the TMF will retain the projected accumulation of mine tailings and runoff, and the current stage of TMF development complies with the CDA design standards. The associated report to document EOR semi-annual TMF Capacity Review is provided in Appendix C.4 (MEM-181-900.300-A-23DEC20)-. Further documentation to support the TMF Capacity Review work completed in 2020 by Stantec (with review by the EOR) is provided with the Water Balance Revision #13 Update Report dated April 21, 2020 and the Updated TMF Capacity Memo dated April 19, 2021 included in Appendix C.4.

6.3 Independent Tailings Review Board

As per the Mining Association of Canada - 2019 Tailings Management Guide, regular independent review is recognized as a best available practice for responsible tailings management. In recognition of this, the senior management team at AMNS has contracted an Independent Tailings Review Board (ITRB) with the view that it provides independent review of the design, construction, operation, and closure of the Touquoy Mine, specifically focused on the TMF, as it pertains to geotechnical, geochemical and water quality aspects. The objectives of the ITRB are to ensure all practices conform to international best practices, minimize non-compliance with regards to permits and licenses, and minimize the potential for adverse environmental effects to downstream aquatic receptors.

The Touquoy ITRB consists of three independent tailings management experts performing their review of our facility at minimum once per calendar year. The October 2020 ITRB meeting represented the sixth official meeting and the fourth since the commencement of tailings discharge. The ITRB comprises of three experts: Peter Lighthall (P.Eng.), Karlis Jansons (P.Eng.), and Alan Martin (M.Sc., P.Geo., R.P.Bio) who together have over 112 years combined experience in mine waste and mine water management, mine closure, geochemistry, and water quality.

Prior to meeting, the ITRB are provided with a comprehensive suite of documents for review. The document package includes water quality and geochemical monitoring results, annual monitoring reports, TMF as-built drawings, water balance studies, tailings deposition plans, DSI reports, and updates to TMF management plans, as well as any technical reports associated with the TMF that have been completed since the last ITRB meeting. The TMF EOR and various environmental consultants support the development of this package. This includes a review of geochemical data associated with the waste rock facility and tailings. As well as a review of water quality associated with the TMF infrastructure (TMF pond, seepage ponds and polishing pond) and surrounding groundwater and surface water.

Typically, the ITRB meetings take place over a two-day period and consist of a series of presentations, site tour of the tailings facility, and a closeout meeting. The presentation portion is conducted jointly by AMNS and Stantec (EOR); the presentation provides the ITRB with updates on construction/operation, water management, effluent treatment, environmental monitoring, and the status of recommendations provided by the ITRB since their last visit. In 2020, the ITRB review was completed remotely via Microsoft Teams on October 28-29, 2020 due to Covid-19 restrictions. In lieu of a site tour, the ITRB members were provided with drone videos and a selection of photographs of the facility. During the closeout meetings the ITRB provide their preliminary comments and recommendations generated from their review of information provided, as well as from the content of the presentation and site tour. Following the assessment, the ITRB issues a letter to AMNS with their overall findings, gaps identified, and recommendation for future operations.

The ITRB review did not identify any areas of non-compliance or conditions which compromise TMF integrity. The ITRB concluded from its 2020 review that the overall stewardship of the TMF met its expectations of good practice. A summary letter from the ITRB, prepared for inclusion in the 2020 IA Annual report, is included in Appendix C.5.

7 Mine Rock Geochemistry

7.1 ML/ARD Sampling Program

During 2020 AMNS continued to implement a waste rock and tailings sampling and analytical program for the identification and management of potentially acid generating (PAG) rock. This program is meant to comply with IA Condition 10 g) which is associated with construction, and Condition 19 which is associated with acid rock drainage contingency. These conditions require monitoring of fill material, waste rock, ore and tailings for parameters associated with potential acid rock generation and drainage. As required by Condition 19 d) of the IA, the following is a summary of testing completed to meet IA requirements.

In 2020, 189 mine rock samples and 55 tailings samples were submitted for metal leaching (ML) and acid rock drainage (ARD) monitoring purpose. Results of this testing are outlined in Appendix C.6, and highlighted below:

- Within the mine rock population, 31 samples (16%) showed an NPR < 2 and can be considered PAG while 65 (34%) samples showed an NPR < 3 prompting confirmatory net acid generation (NAG) testing. Four of the samples submitted for single-addition NAG testing had a NAG pH of < 4.5 and can be considered PAG. Net potential ratio (NPR = NP/AP) values range from 0.55 to 157 with a median value of 4.3. The proportion of PAG samples in 2020 saw a slight decrease to that calculated from the pre-2020 database.
- To assess ML potential, 24 waste rock samples underwent SFE testing. The sample frequency was noted to be higher than required by the respective SOP. The samples that underwent SFE testing all produced neutral to alkaline pH values, ranging from 7.6 to 9.2 with a median of 8.5. Arsenic shows a range of 0.0036 to 0.71 mg/L with a median of 0.056 mg/L in SFE solutions. This constitutes a decrease in comparison to 2019 data.
- While eleven tailings samples (20%) submitted were classified as PAG, no tailings sample was conclusively identified as PAG by the single or multi-addition NAG test. The total range of NPR values for the tailings population ranged from 1.6 to 5.7. The PAG proportion has decreased since 2019 where 50% of tailings samples were classified as PAG.
- In response to an NSE directive mandating additional PAG management planning, Lorax was retained to develop a PAG water quality model to evaluate the long term potential for ARD from the Touquoy WRSA. This exercise will be supported by the verification ML/ARD drilling program completed in early 2021 and will inform the need for additional mitigation strategies as well as reclamation planning.

The number of samples collected, and sampling methods used in 2020 complied with the sampling requirements established in the IA (Lorax, 2021). The stored waste rock material as a whole generally contains an excess in NP and therefore there is no immediate risk of ARD development in the Touquoy WRSA (Lorax, 2021).

Weekly monitoring of water from the open pit for pH continued in 2020, the results of which are summarized in Appendix C.1. A summary of the results shows a neutral pH with mean and median values of 7.45 and 7.39, respectively. This is generally consistent with 2017, 2018 and 2019 results.

Monitoring of the pH in the waste rock collection ponds continued in 2020 and is scheduled on a weekly basis. The water in these ponds shows an alkaline pH, with an average value of 7.52 and a median value of 7.56. This is generally consistent with 2018 and 2019 results. These results are provided in detail in Appendix C.1.

7.2 SOP Update

As required by Condition 19 b) (ii) of the IA, a professional geochemist (Lorax) completed an annual review of the Standard Operation Procedures (SOPs) “*Blast Material Sampling and Handling – AGC-PRO-GEO-007*” and “*Tailings Solids Sampling – AT-PRC-PRO-8027*”. These SOPs were revised on April 21, 2020 and April 28, 2021, respectively, to incorporate prompt reporting requirements for PAG samples to NSE and other revisions based on recommendations made by Lorax. To comply with regulatory requirements as well as AMNS’s internal policies, blast material sampling and tailings solids sampling procedures shall be reviewed and updated annually. The associated documents are provided in Appendix C.6.

7.3 Verification Monitoring

In order to understand the distribution of PAG rock within the WRSA and low-grade ore (LGO) stockpile, AMNS has implemented the verification monitoring work plan as provided to NSE on December 4, 2020 (see Appendix C.6). The work plan will confirm the geochemical character of previously placed material via the four drill holes within the WRSA and one within the LGO stockpile completed in January 2021. All samples were analyzed by the on-site laboratory for total sulphur (total S) and were also be sent to an external laboratory for selected acid base accounting (ABA) analyses including paste pH, sulphate S, and modified Sobek neutralization potential (NP). A subset of samples (1 in 5 samples) underwent confirmatory total S analysis to validate the representativeness of the sampling method and to validate the in-house total sulphur analytical techniques.

The results of this work plan will be evaluated by Lorax to determine if there are any high-risk areas for ARD development within the rock piles and to assess the effectiveness of any future PAG mitigation strategies that are selected. Additionally, Lorax has also recommended that confirmatory sampling should be conducted as material is placed in the WRSA and LGO stockpile. A sampling frequency of one sample for every 400,000 tonnes of material placed is proposed. This sampling is in addition to the more frequent monitoring conducted during grade control and/or blasthole sampling as per the ML/ARD Management Plan (Lorax, 2020b), provided to NSE on October 14, 2020.

8 Erosion and Sediment Management

This section of the annual report has been added in order to satisfy Condition 10.b.iii of the IA (November 4, 2020 update). As confirmed by NSE in an email dated September 15, 2020 (Pers. Comm. Rachel Bower), a partial summary of the rain monitoring program for 2020 (August to December) should be reflected in the 2020 annual report.

During 2020 AMNS developed a Rain Event Monitoring Protocol. This Protocol was developed in order to ensure that onsite erosion and sedimentation controls (i.e., ponds, ditches, road grading, berms, silt

curtains, silt fences, hay bales, etc.) are maintained and functioning and to establish a detailed procedure for monitoring onsite waterbodies for uncontrolled runoff. Pre-rain checks are completed if a heavy rainfall event (Rain in excess of 15mm in 24 hours, or 5-10mm within three hours) is forecasted based on the local forecast through Environment Canada or The Weather Network. All checkpoints as outlined in the Rain Check Form AGC-ENV-FRM-001 are checked during a pre-rain check. Checks include:

- Sediment control ponds are ready to receive runoff and pumps are available on standby
- Haul road crossings are clear of ponded water and pumps are available on standby;
- WRSA and TMF seepage ponds collection ponds are pumped low and are ready to receive runoff and pumps are available on standby;
- If any irregular Site operations (i.e., new construction activities or projects) are occurring-confirm required controls are in place and project team is prepared for rain; and
- Inspect watercourses for signs of turbidity at the following locations (note that background locations are checked if concerns are observed downstream):
 - Watercourse #4: SW-23 (background), WC4 culvert A and B, WC4-D, SW-03, and along Moose River Road;
 - Scraggy Lake: SW-12 (background);
 - Moose River: SW-11 (background) and SW-01; and
 - North TMF ditching.

Rain check inspections are completed as per AMNS Rain Event Monitoring Protocol to assess any changes at pre-rain check locations and include the following additional inspection measures:

- Look for indications of new or continuing impacts such as seeps, stressed vegetation or staining.
- Ensure that all erosion and sedimentation controls are efficiently working.
- Check that collection ponds have freeboard to prevent overtopping and that pumps are operating. If they need maintenance, alert the appropriate department as specified above.
- Take pictures and include them with your form. Photos should be appropriately labeled.
- Look for signs of turbidity in the watercourses at the locations listed above.

In total, 39 checks were completed between August 1, 2020 and December 31st, 2020: 14 pre-rain checks and 25 rain checks. All identified releases have been reported to NSE and are further discussed in Section 2. A summary of the results from the Rain Event Monitoring checks are provided in Table 7, Appendix B.

8.1 High Flow Monitoring

As part of the Rain Event Monitoring program, quarterly TSS samples are collected from each location along Watercourse #4 to document that erosion control mitigation is working during all seasons. Note that although Hurricane Teddy took place during Q3, safety concerns relating to high winds prevented high flow monitoring from being completed for this event. A summary of the results from the Q3 (July to September 2020) and Q4 monitoring (October to December 2020) are provided in Appendix B, Table 8. With the exception of one sample (SW-23), all sample locations had TSS concentrations well below high flow monitoring requirements as outlined in Condition 15(d) of the IA, indicating sediment and erosion

control measures are operating effectively. SW-23 is a background sample location taken upstream of site in Watercourse 4, this result is thought to be attributed to a sampling or laboratory error.

8.2 Erosion and Sediment Control Efforts

AMNS completed various sediment and erosion control mitigative measures in 2020 in accordance with AMNS's erosion and sediment control plan (Erosion and Sediment Control Plan - Update) prepared by Stantec dated June 30, 2020. Specific work for 2020 includes the engineering and construction of an enlarged sediment pond along the Waste Rock Haul Road, construction of a ditching system and collection pond at the Scraggy Lake Overburden Stockpile, silt fence/hay bales/coir logs installation during ground disturbance activities, and grading activities to facilitate runoff management. Performance of these controls has been monitored and continually improved over time based on monitoring results and on-going advice of independent sediment control experts, as well as any comments or direction received from NSE. Current measures involve substantial diversion of surface runoff from site roadways that cross Watercourse 4.

Collection ponds on site are routinely monitored as part of AMNS Rain Monitoring Protocol as well as part of daily operations. Accumulated sediment is removed from ponds and improvements are made as needed. Sediment pond improvements were made at existing control points along the site access roads and haul roads including the collection pond constructed at the Haul Road Crossing south of Mooseland Road and the engineering and construction of an enlarged sediment collection pond along the Waste Rock Haul Road to increase capacity and improve contact water management.

The construction of the Scraggy Lake Overburden Stockpile collection pond and ditching began in August 2020. Design work was completed by DesignPoint and project-specific erosion and sediment control plan was prepared by Stantec. The project consisted of approximately 460 metres of rock lined ditching to the east of the stockpile connecting to a collection pond to the south-east. Additional ditching work was also completed for the northwest side to redirect drainage along the west side of the stockpile to the collection pond. The collection pond and ditching was complete in October 2020, containing all runoff from the stockpile.

8.3 Independent Support

AMNS retained Stantec to provide erosion and sediment control support across the site. In 2020, Stantec support was focused the construction of Scraggy Lake Overburden Stockpile collection pond and ditching, improvements for the TMF stockpile, storm event preparation (for extreme weather events/hurricanes) and follow up, as well a general advice and support.

AMNS environmental staff held weekly meetings with Stantec erosion and sediment control experts during the construction of the Scraggy Lake Overburden Stockpile. These weekly meetings began in September 2020 and discussed relevant erosion and sediment control concerns and construction progress. These weekly meetings lasted the duration of the project and extended throughout the remainder of 2020 to provide continued on-site erosion and sediment control support.

A Stantec geotechnical engineer providing erosion and sediment control support completed four site visits in 2020. The first site visit was completed in July 2020 to inspect sediment controls along the Waste Rock Haul Road and TMF Haul Road. The second visit occurred in September 2020 to complete a

site-wide inspection of all erosion and sediment controls in preparation for the Hurricane Teddy storm event. Two site visits were completed in November 2020 to inspect and develop corrective actions for the TMF Haul Road Area.

8.4 Wetland and Swift-Flowing Habitat Monitoring

Follow-up wetland monitoring of Wetland 6, Wetland 15 and Watercourse 4 was completed by Stantec in 2020 as recommended following the initial site visit in 2019 (Year 0). Results of this program were provided to NSE in the following report: *Monitoring of the Effects of Sediment Deposition in Wetlands 6 and 15, Touquoy Mine, Nova Scotia: Year 1 (2020)* dated March 29, 2021. A summary of the assessment is provided below.

Year 1 monitoring results for Wetland 6 observed localized mortality of sphagnum moss at three locations. Vascular plant cover experienced a relatively small reduction with little change to species richness or plant species composition. Information regarding the recovery of the open bog plant community will not be available until the Year 3 (2022) and Year 5 (2024) data is available.

In Wetland 15, the Year 1 monitoring results suggest that the effects of sediment deposition were highly localized and mainly limited to ground vegetation species. The effects to ground vegetation species were moderate with less than 10% of ground surface covered by sediment deposits within the monitoring quadrants. Continued monitoring in years three and five will provide information on the recolonization rate of vegetation species.

Stantec also completed an assessment of swift-flowing sections of Watercourse 4 in response to siltation events. The potential effects of siltation on fish and fish habitat in Watercourse 4 were thought to be reversible. Silt that was observed at sites appeared to be stable and habitats with lower water velocity and gradient may require more time to restore to pre-siltation substrate composition. Follow-up monitoring is planned for years three and five.

8.5 TMF Haul Road Construction

In response to the nine reportable events at the TMF Haul Road Culvert B upstream, Stantec has redesigned the TMF Haul Road to mitigate sedimentation in Watercourse 4. The design involves regrading the haul road to position the low point away from Watercourse 4. The road cross-section will have a reverse crown to keep runoff away from the road edges and berms and will connect to a collection ditch leading to the TMF seepage collection system.

Construction of the TMF Haul Road involves the excavation of the current roadbed and the installation of multiple filter layers and filtration fabric within the road subgrade to filter water that penetrates through the road surface. A testing apparatus was designed and carried out to verify the effectiveness of the proposed filter concept. The laboratory results showed an initial flush of sediment from the filter layer, but it was observed that the lab scale test system was successful in providing filtration of the sediment laden water. A project-specific erosion and sediment control plan was prepared by Stantec with construction and erosion control efforts supervised by a Stantec representative throughout the duration of the project. Construction of the TMF Haul Road is scheduled to be complete spring 2021.

9 Insurance Requirements

As per Condition 22, environmental impairment liability insurance will be maintained by AMNS in the minimum amount of ten million dollars (\$10,000,000). The insurance shall name Nova Scotia Environment as insured. The insurance policy became effective on May 30, 2016, with the final policy submitted to NSE by AON on July 19, 2016.

Specific to the annual report, Condition 22 states:

b) The Approval Holder shall review the adequacy of insurance coverage on an annual basis and provide a status report to the Department with the annual report due April 30.

Based on the review of the policy from Zurich Insurance Company Ltd. for the site pollution incident legal liability up to \$10,000,000 (Policy No. 8615384), the term expires on May 30, 2021. Currently, AMNS is in the process of renewing this policy before the term expiry date.

There have been no claims or notices against this policy. The insurance is considered adequate and meets IA Condition 22a).

10 Community Consultation and Engagement

10.1 Community Liaison Committee (CLC)

A Community Liaison Committee (CLC) has been in place for the Touquoy Project since 2011 and was expanded in late 2016. The CLC typically meets on a quarterly basis however due to COVID-19 restrictions in 2020, the CLC met in person on two occasions. These meetings were held on January 11 and November 7, 2020. During these meetings, AMNS provided the CLC with updates on site activities, employment, and regulatory environment and safety non-compliance issues and incidents noted during the preceding time period. Summaries of the CLC meetings are posted on the Community section of the St. Barbara website under the Nova Scotia heading (<https://stbarbara.com.au/community/nova-scotia/>). A teleconference meeting was also held on December 22, 2020 to discuss proposed site modifications.

In response to the CLC's previous concerns regarding the structural condition of the Scraggy Lake dam, AMNS commissioned two investigation studies. The studies completed include investigation into the number of structures/camps in the vicinity of Scraggy Lake, as well as a study investigating the effect of a dam failure on water levels in Scraggy lake. The results of these studies were presented and discussed during the CLC during the November 2020 meeting. The final reports were also provided to CLC members.

AMNS requested input from the CLC for the proposed Beaver Dam haul road during the January 11, 2020 and November 7, 2020 meetings. The CLC provided input regarding local ATV groups that may be impacted by the Beaver Dam haul road during the January 11, 2020 meeting. At the November 7, 2020 meeting the CLC provided feedback on format and content for a planned open house meeting with

Mooseland Community members on the proposed Beaver Dam Mine Project. COVID travel restrictions required that the open house be moved to an online format in December 2020.

The purpose of the meeting held via teleconference in December 2020 was to discuss proposed modifications to the Touquoy Mine. The proposed modifications discussed included the expansion of the WRSA, relocation of the Administration road and associated drainage modifications. Further topics discussed included the proposed height increase of the TMF and expansion of the clay borrow area.

10.2 First Nations Engagement

In 2020, COVID restrictions limited engagement efforts including those with First Nations. AMNS engagement with Mi'kmaq of Nova Scotia, specifically with the Assembly of Nova Scotia Mi'kmaq Chiefs via the Kwilmu'kw Maw-klusuaqn Negotiation Office (KMKNO) as well as the two nearest Mi'kmaq communities of Sipekne'katik and Millbrook First Nations were focused more on the proposed Beaver Dam Mine and Fifteen Mile Stream projects. During those meetings, ad hoc inquiries regarding Touquoy were addressed. Site updates were communicated during conference calls and online meetings. AMNS continues to provide updates in written submissions and newsletters. AMNS looks forward to being able to host site visits and participate community meeting in the future as COVID restrictions are lifted and uncertainties addressed. AMNS will continue to pursue mutually beneficial relations with First Nations groups in 2021 and beyond.

10.3 Community Complaints

During 2020, AMNS received four new community complaints. Two of these complaints were related to road conditions at the haul road crossing and Mooseland Road. A complaint received during a public engagement meeting included concerns about the use of remote cameras, the lack of an ATV by-pass trail and the location of the silt curtain in Scraggy Lake. The final complaint received related to sediment entering an off-site watercourse near a contractor clay excavation site.

A complaint received in March 2020 about the haul road crossing road conditions involved a public vehicle that was splashed with mud from an on-coming vehicle that was speeding. A check of the GPS system was conducted and did not indicate any AMNS vehicles exceeding the speed limit in the area.

A community concern was received in August 2020 regarding muddy conditions at the haul road crossing and potential damage to vehicles as a result. AMNS completed SOP updates to ensure prompt clean-up of mud on the road following a rain or snowfall event, and to include reporting of any rock fall from trucks on the crossing area that could impact local vehicles.

An engagement meeting with three individuals on October 30, 2020 raised concerns about the use of remote cameras, the lack of an ATV by-pass trail and the location of the silt curtain in Scraggy Lake. AMNS confirmed no digital or hard copies of pictures are distributed except those in which an actual incident is documented (e.g., theft or vandalism). There is a camera on the pump house to monitor the effectiveness of sediment and erosion controls; however, the range does not include the old boathouse.

The individuals also inquired about the development of a by-pass trail for ATVs to access Scraggy Lake. AMNS is currently investigating options within current the current Project footprint. Finally, AMNS confirmed the sediment curtain in Scraggy lake is not affixed to the old boat house. AMNS continues to follow-up with community members on their inquiries.

In December 2020, AMNS received a community concern regarding sediment entering an off-site watercourse near a contractor clay excavation. While the clay excavation is not an AMNS owned or operated location, AMNS provided support to the local contractor for sampling and erosion and sediment control.

In addition to the new complaints listed above, a resident living in Mooseland continued to submit complaints regarding traffic speeding through their community. This individual has made occasional complaints since 2016. The Company has reached out to this resident on each occasion a complaint was received using the established complaint resolution plan.

There is some uncertainty regarding whether the traffic in question originated from the mine site, however, AMNS management assumed it was and took the following actions:

- Reached out to talk with the community resident soon after the complaint was received to compile information to assess the seriousness of the complaint.
- Implemented corrective action that including attempting to locate the vehicle in question. All AMNS light vehicles are equipped with GPS tracking devices to identify speeding. Apply discipline to the individual(s) involved if they were identified up to and including suspension of site privileges.
- Provide instructions for supervisors to inform their employees and contractors of the situation and to hold toolbox meetings where crews are warned about the dangers and risk of speeding through the local communities.

The CLC was made aware of these complaints during 2020 meetings and the follow-up actions undertaken by AMNS to address those concerns.

11 Closure

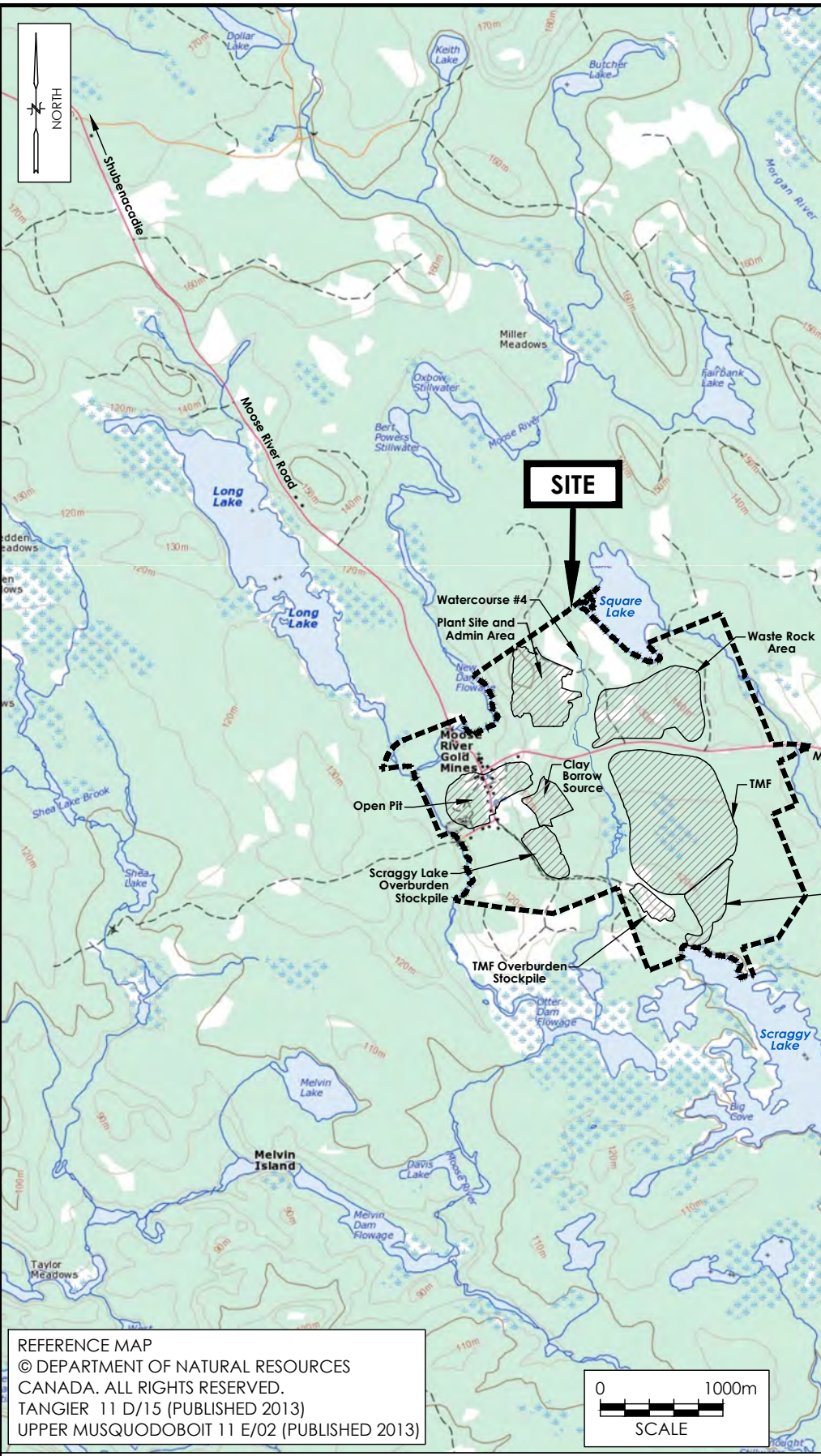
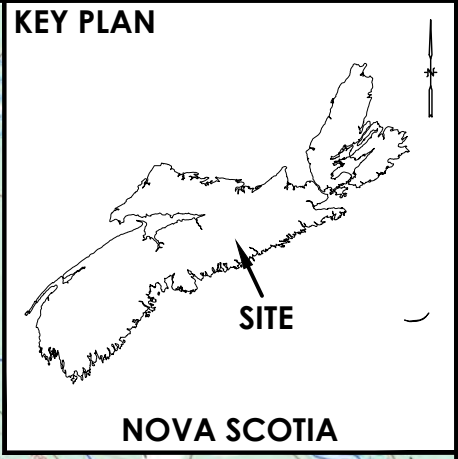
This report in combination with the Stantec 2020 Annual Surface Water and Groundwater Monitoring Report forms the 2020 Annual Report for the Touquoy Gold Mine in compliance with Condition 12c) of the IA.

This report is intended to address the annual reporting requirements in accordance with IA Condition 12c) of Approval No. 2012-084244-08 (File No. 92100-30-BED-2012-084244).

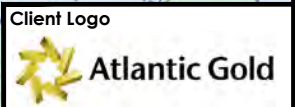
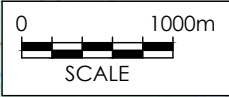
Appendix A

Drawings

V:\1216\active\121619250\1_drawings_logs\2500_TOUQUOY\4_Sheet_Files\13_TASK-2035\121619250.2500.2035_2020-SWGW_D01_REV0.dwg



REFERENCE MAP
 © DEPARTMENT OF NATURAL RESOURCES
 CANADA. ALL RIGHTS RESERVED.
 TANGIER 11 D/15 (PUBLISHED 2013)
 UPPER MUSQUODOBOIT 11 E/02 (PUBLISHED 2013)



THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

SITE LOCATION PLAN AND GENERAL LAYOUT TOUQUOY GOLD PROJECT HALIFAX COUNTY, NOVA SCOTIA	Job No.: 121619250	Dwg. No.: 1
	Scale: 1 : 50,000	
	Date: 2021 04 21	
	Dwn. By: JL	
Client: ATLANTIC MINING NS INC.	App'd By: JG	

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The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.
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Client Logo



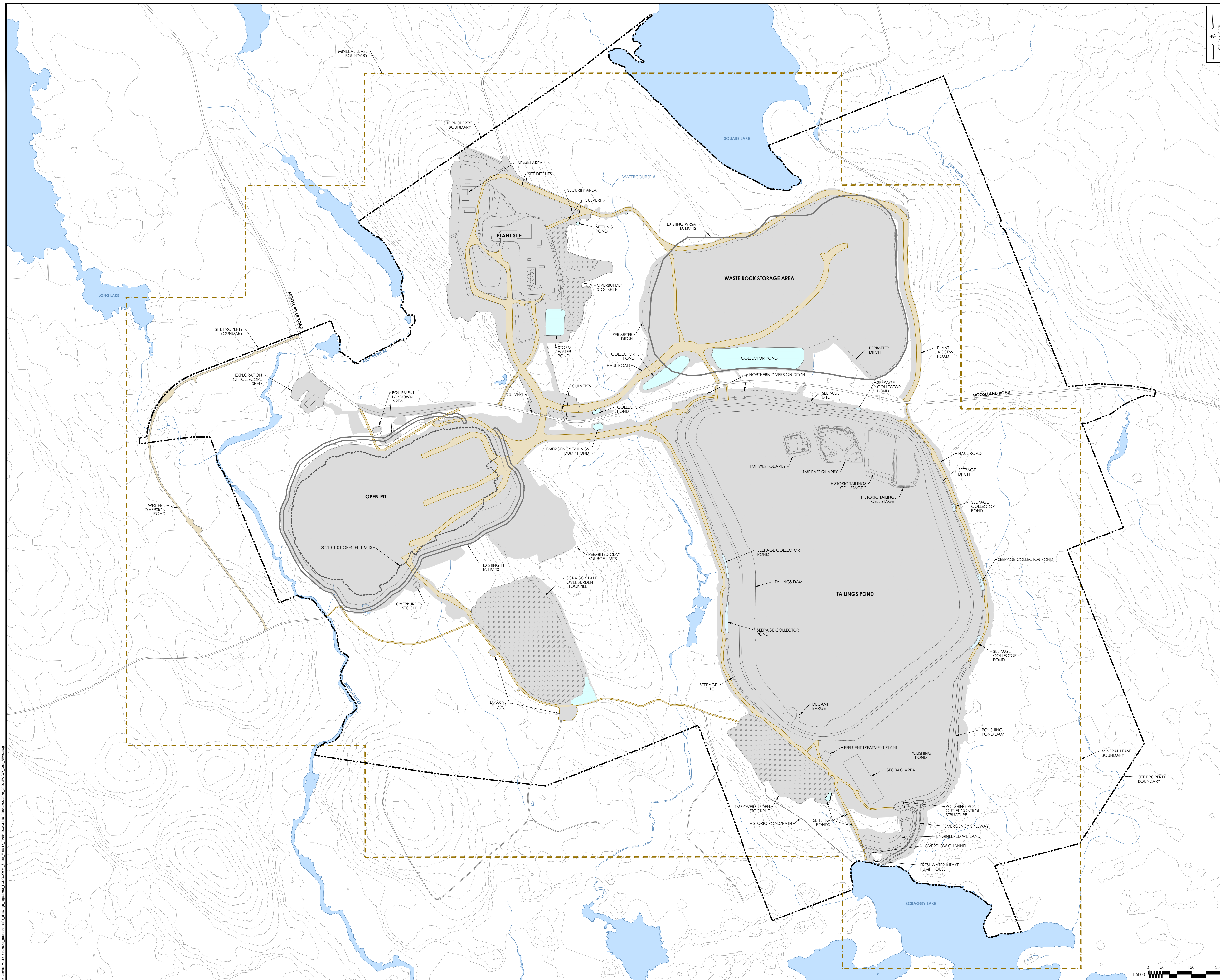
Legend

- CONTOUR, 2m (LIDAR, 2010)
- - - - - SITE PROPERTY BOUNDARY
- - - - - MINERAL LEASE BOUNDARY
- - - - - EXISTING PTA LIMITS / WISA IA LIMITS
- - - - - EXISTING ROAD
- - - - - HISTORIC ROAD/PATH
- - - - - PERIMETER/SITE DITCH
- - - - - SEEPAGE DITCH
- - - - - EXISTING WATERCOURSE
- WATERBODY
- COLLECTOR / SETTLING POND
- DISTURBED AREAS (2020)
- OVERBURDEN STOCKPILE
- HAUL/ACCESS ROAD

Notes

1. BACKGROUND TOPOGRAPHY SHOWN IS BASED ON LIDAR DATA PROVIDED BY CONESTOGA-ROVERS & ASSOCIATES (2010). ACTUAL FIELD CONDITIONS MAY VARY.
2. SITE DATA PROVIDED BY ATLANTIC GOLD CORPORATION.

STAMP		STAMP	
REVISIONS			
No.	DETAILS	BY	APPD. DATE
CLIENT: ATLANTIC MINING NS INC.			
PROJECT: TOUQUOY GOLD PROJECT			
PROJECT LOCATION: HALIFAX COUNTY, NOVA SCOTIA			
JOB No:	SCALE:	DATE:	
121619250	1 : 5000	2021-04-28	
DRAWN BY:	DESIGNED BY:	APPROVED BY:	
JL	MN	JG	
DRAWING TITLE: EXISTING SITE CONDITIONS			
DRAWING No:			REVISION No:
2			0



Appendix B

Tables

Table 1: 2020 Disturbance Limits

Location	Area (m2)	Area (Hectares)
Tailings Management Facility	1,255,970	125.6
Waste Rock Storage Area	489,512	49.0
Open Pit, Clay Borrow, Mine Roads	450,906	45.1
Plant Site, Admin Offices, Warehouse, Truck Shop, ROM Road	287,423	28.7
Scraggy Lake Overburden Stockpile	126,875	12.7
Tailings Management Facility Stockpile	51,820	5.2
Core Facility, Lookoff Parking, Mining Laydowns	31,960	3.2
Western Diversion Road	13,600	1.4
	Total	270.8

Table 3 - 2020 Open Pit Blast Monitoring Data

			Location					
			7212 Moose River Road			Cabin in the woods		
Blast Number	Date	Time	Distance (m)	PPV (mm/sec)	SBL (dB)	Distance (m)	PPV (mm/sec)	SBL (dB)
19-153-070-34	02-Jan-20	14:50	2,800	0.709	99.94	745*	1.498*	111.8*
20-153-060-01	06-Jan-20	14:54	2,720	<0.32	<120	1,380	0.851	97.53
20-153-070-01	07-Jan-20	14:55	2,720	<0.32	<120	699*	0.946*	112.5*
20-153-070-02	09-Jan-20	14:56	2,720	<0.32	<120	699*	0.946*	112.5*
20-153-070-T01	09-Jan-20	14:56	2,780	<0.32	<120	399*	2.514*	107.8*
20-153-060-02	10-Jan-20	15:52	2,720	0.457	98.62	1,390	1.482	98.54
20-153-070-03	13-Jan-20	14:55	2,810	0.56	100	1,680	1.18	101
20-153-060-03	16-Jan-20	13:27	2,840	<0.32	<120	1,380	1.47	97.62
20-153-060-04	21-Jan-20	15:55	2,840	<0.51	<120	1,380	0.567	102.8
20-153-070-T02	24-Jan-20	15:21	2,600	0.323	91.95	1,420	0.899	89.84
20-153-070-T03	27-Jan-20	14:53	2,600	0.323	91.95	1,420	0.899	89.84
20-153-070-04	27-Jan-20	14:53	2,820	0.331	<120	1,672	0.741	100.5
20-153-060-05	29-Jan-20	14:55	2,720	0.355	<88	1,490	0.733	100.5
20-153-060-06	03-Feb-20	14:49	2,820	0.315	88.68	1,360	1.206	102
20-153-070-T04	05-Feb-20	14:56	2,250	0.441	89.16	1,480	0.481	94.57
20-153-060-07	07-Feb-20	14:57	2,350	<0.32	<120	1,350	1.143	106.7
20-153-070-T05	10-Feb-20	14:51	2,670	<0.32	<120	1,630	0.339	96.07
20-153-060-08	12-Feb-20	14:48	2,660	0.465	101	1,430	1.23	102
20-153-060-09	12-Feb-20	14:48	2,660	0.465	101	1,430	1.23	102
20-153-060-10	14-Feb-20	15:19	2,700	0.323	97.16	824	1.797	121.2
20-153-055-01	14-Feb-20	15:19	2,700	0.323	97.16	824	1.797	121.2
20-153-060-T01	18-Feb-20	14:48	2,880	<0.32	<120	1,380	2.089	104.6
20-153-060-11	19-Feb-20	14:49	2,680	<0.32	<120	1,480	0.985	101.1
20-153-060-12	21-Feb-20	14:55	2,700	<0.32	<120	1,600	1.056	107.1

Table 3 - 2020 Open Pit Blast Monitoring Data

			Location					
			7212 Moose River Road			Cabin in the woods		
Blast Number	Date	Time	Distance (m)	PPV (mm/sec)	SBL (dB)	Distance (m)	PPV (mm/sec)	SBL (dB)
20-153-070-T06	24-Feb-20	14:55	2,690	<0.32	<120	1,700	0.891	106.4
20-153-070-T07	25-Feb-20	14:53	2,800	<0.32	<120	1,640	0.481	103.3
20-153-060-13	26-Feb-20	14:57	2,640	-	-	1,430	2.175	99.23
20-153-060-14	02-Mar-20	14:50	2,690	<0.32	<120	1,550	0.859	107
20-153-060-T03	03-Mar-20	14:50	2,810	<0.32	<120	1,350	0.788	101.3
20-153-060-15	06-Mar-20	14:53	2,750	<0.32	<120	1,670	1.19	110
20-153-070-T08	06-Mar-20	14:56	2,750	<0.32	<120	1,670	1.19	110
20-153-060-T04	10-Mar-20	14:56	2840	<0.32	<120	1690	0.828	97.26
20-153-060-16	12-Mar-20	14:57	2650	0.418	91.6	990	1.852	105.6
20-153-060-17	16-Mar-20	14:51	2850	<0.32	<120	1520	0.56	105.5
20-153-060-T05	19-Mar-20	14:57	2750	0.426	90.86	1350	2.33	98.38
20-153-060-18	20-Mar-20	14:55	2520	0.512	95.06	1580	1.66	96.98
20-153-070-T09	23-Mar-20	13:00	2810	<0.32	<120	1640	0.623	96.88
20-153-060-19	25-Mar-20	12:00	2670	0.481	<88	1570	0.772	107.2
20-153-060-20	26-Mar-20	15:05	2680	0.504	95.06	525	2.404	111.3
20-153-060-T06	26-Mar-20	15:02	2680	0.504	95.06	525	2.404	111.3
20-153-060-21	30-Mar-20	14:54	2770	0.41	<120	1580	0.796	101.2
20-153-060-22	02-Apr-20	14:54	2680	<0.32	<120	1600	1.056	104.4
20-153-070-T10	03-Apr-20	14:55	2850	0.347	98.38	1650	0.662	113.9
20-153-110-01	09-Apr-20	14:55	2970	0.33	103.5	1970	0.33	100
20-153-060-23	06-Apr-20	14:54	2780	0.859	<88	1610	1.84	92.76
20-153-060-24	13-Apr-20	14:52	2800	0.81	100	1630	1.24	105.5
20-153-060-25	15-Apr-20	14:57	2810	0.62	105.5	1590	1.32	106

Table 3 - 2020 Open Pit Blast Monitoring Data

			Location					
			7212 Moose River Road			Cabin in the woods		
Blast Number	Date	Time	Distance (m)	PPV (mm/sec)	SBL (dB)	Distance (m)	PPV (mm/sec)	SBL (dB)
20-153-060-T07	17-Apr-20	14:51	2630	0.4	95.9	1380	1.7	103.5
20-153-060-26	20-Apr-20	14:53	2800	0.67	<88	1660	0.867	99.31
20-153-060-27	22-Apr-20	15:50	2820	0.71	101.9	1560	1.25	100
20-153-060-T08	24-Apr-20	14:51	2610	1.43	100	1430	1.08	100
20-153-060-28	24-Apr-20	14:51	2610	1.43	100	1430	1.08	100
20-153-080-01	27-Apr-20	14:59	2650	1.498	109.2	1640	0.977	109.8
20-153-060-29	28-Apr-20	14:58	2750	0.76	91.5	1680	0.78	106.5
20-153-050-01	01-May-20	14:55	2790	0.89	107	1380	2.02	113.5
20-153-050-02	04-May-20	14:58	2775	<0.32	<120	1365	1.7	117.2
20-153-080-03	05-May-20	11:00	2840	-	-	1930	-	-
20-153-080-02	11-May-20	14:58	2780	1.1	102.8	1860	0.62	117.5
20-153-050-03	13-May-20	13:07	2810	<0.28	<120	1370	<0.28	<120
20-153-060-T09	14-May-20	13:40	2710	-	-	1670	-	-
2020-050-04	19-May-20	14:55	2710	0.65	94	1400	1.9	104.9
2020-050-05	21-May-20	14:18	2610	0.536	96.38	1450	0.883	105.7
2020-060-T10	21-May-20	14:18	2610	0.536	96.38	1450	0.883	105.7
2020-050-06	26-May-20	14:59	2670	0.635	101	1420	1.79	98.8
2020-050-07	29-May-20	14:52	2680	0.51	97.5	1450	0.97	97.5
2020-060-T11	29-May-20	14:52	2680	0.51	97.5	1450	0.97	97.5
2020-060-T12	01-Jun-20	14:52	2680	0.52	91.5	1630	0.59	103.5
2020-050-08	03-Jun-20	13:02	2710	0.65	104.2	1480	1.32	101.9
2020-050-09	05-Jun-20	14:40	2720	0.65	98.8	1520	1.03	101.9
2020-050-10	08-Jun-20	14:53	2670	1.44	94	1510	0.81	103.5

Table 3 - 2020 Open Pit Blast Monitoring Data

			Location					
			7212 Moose River Road			Cabin in the woods		
Blast Number	Date	Time	Distance (m)	PPV (mm/sec)	SBL (dB)	Distance (m)	PPV (mm/sec)	SBL (dB)
2020-060-T13	08-Jun-20	14:53	2670	1.44	94	1510	0.81	103.5
2020-050-11	10-Jun-20	14:53	2740	0.56	95.9	1550	1.27	107
2020-060-T14	15-Jun-20	14:48	2770	0.812	<88	1700	<0.32	<120
2020-060-30	15-Jun-20	14:48	2770	0.812	<88	1700	<0.32	<120
2020-050-12	16-Jun-20	15:01	2740	0.544	<88	1580	1.18	98.86
2020-050-14	19-Jun-20	14:53	2740	0.54	100	1600	0.84	108.8
2020-050-13	22-Jun-20	15:39	2670	0.62	106.5	1540	1.02	108.8
2020-060-T15	22-Jun-20	15:39	2860	0.62	106.5	1660	1.02	108.8
2020-050-16	24-Jun-20	14:53	2790	<0.32	<120	1450	0.825	97.3
2020-050-15	26-Jun-20	14:46	2810	0.54	94	1630	0.841	101
2020-045-01	29-Jun-20	14:54	2710	0.33	103.5	1450	1.3	102.8
2020-060-T16	29-Jun-20	14:54	2710	0.33	103.5	1450	1.3	102.8
2020-050-17	02-Jul-20	14:51	2750	0.54	98.8	1660	0.68	103.5
2020-060-T17	03-Jul-20	14:52	2860	<0.32	<120	1530	0.73	105.5
2020-050-18	06-Jul-20	14:46	2780	<0.32	<120	1510	0.9	105.5
2020-050-19	08-Jul-20	14:51	2790	0.43	101	1590	0.83	100
2020-050-20	10-Jul-20	14:50	2810	0.48	<88	1580	1.04	94.82
2020-050-21	14-Jul-20	14:48	2810	0.43	<88	1510	0.65	103.5
2020-050-T01	15-Jul-20	13:27	2610	0.59	94	N/ A		
2020-050-22	17-Jul-20	14:53	2840	<0.32	<120	1490	0.891	95.3
2020-050-T02	23-Jul-20	11:58	2660	0.7	100	1390	1.11	103.5
2020-050-T03	27-Jul-20	15:01	2640	0.73	98.8	1540	0.56	106
2020-050-T05	03-Aug-20	14:51	2850	<0.32	<120	1510	0.623	93.36

Table 3 - 2020 Open Pit Blast Monitoring Data

			Location					
			7212 Moose River Road			Cabin in the woods		
Blast Number	Date	Time	Distance (m)	PPV (mm/sec)	SBL (dB)	Distance (m)	PPV (mm/sec)	SBL (dB)
2020-050-T04	05-Aug-20	14:53	2730	0.32	97.5	1350	0.94	95.9
2020-100-01	11-Aug-20	15:56	2970	0.386	103.8	1460	0.835	103.8
2020-105-01	13-Aug-20	14:54	2970	<0.32	<120	1610	0.41	102.8
2020-040-01	17-Aug-20	15:01	2750	0.41	98.8	1450	1.4	111.2
2020-110-02	18-Aug-20	14:54	2920	0.426	<88	1850	<0.32	<120
2020-040-02	20-Aug-20	14:51	2920	0.567	<120	1400	1.955	93.36
2020-040-03	24-Aug-20	14:51	2770	0.38	94	1420	1.38	98.8
2020-050-T06	21-Aug-20	14:49	2800	<0.32	<120	1590	0.638	98.22
2020-040-04	26-Aug-20	14:49	2690	0.607	<88	1420	1.001	93.64
2020-050-T09	28-Aug-20	14:50	2800	0.44	91.5	1660	0.46	104.2
2020-040-05	01-Sep-20	10:50	2680	0.52	94	1440	0.98	102.8
2020-040-06	02-Sep-20	14:48	2710	0.4	97.5	1480	0.92	101
2020-040-07	04-Sep-20	14:48	2710	0.638	92.6	1520	0.796	94.8
2020-050-T10	03-Sep-20	13:35	2730	0.35	91.5	1650	0.43	98.8
2020-110-03	08-Sep-20	14:53	2910	0.402	89.16	1770	0.465	96.78
2020-040-09	10-Sep-20	14:47	2770	0.41	98.8	1500	1.24	94
2020-035-01	12-Sep-20	13:07	2730	0.607	<88	1680	1.4	99.08
2020-050-T11	12-Sep-20	13:07	2730	0.607	<88	1680	1.4	99.08
2020-040-08	14-Sep-20	15:02	2760	0.82	<88	1510	1.37	94.44
2020-040-10	15-Sep-20	14:54	2780	0.536	<88	1550	0.843	100.3
2020-040-11	18-Sep-20	14:51	2770	0.49	95.9	1690	0.92	106.5
2020-050-T12	18-Sep-20	14:51	2770	0.49	95.9	1690	0.92	106.5
2020-100-02	21-Sep-20	14:47	3000	<0.32	<120	1470	0.7	112.3
2020-040-12	24-Sep-20	14:46	2740	0.68	88	1580	0.68	95.9

Table 3 - 2020 Open Pit Blast Monitoring Data

			Location					
			7212 Moose River Road			Cabin in the woods		
Blast Number	Date	Time	Distance (m)	PPV (mm/sec)	SBL (dB)	Distance (m)	PPV (mm/sec)	SBL (dB)
2020-040-13	25-Sep-20	14:47	2690	0.83	94	1560	0.97	98.8
2020-050-T08	25-Sep-20	14:47	2800	0.83	94	1360	0.97	98.8
2020-040-14	28-Sep-20	14:54	2750	0.83	100	1610	0.79	9.5
2020-040-15	30-Sep-20	14:54	2800	0.64	109.5	1600	1.143	119.9
2020-040-16	01-Oct-20	14:53	2760	0.43	101	1640	0.71	97.5
2020-050-T07	01-Oct-20	14:53	2840	0.43	101	1420	0.71	97.5
2020-040-18	05-Oct-20	14:54	2770	0.631	<88	1660	1.21	102.6
2020-040-17	05-Oct-20	14:54	2810	0.631	<88	1560	1.21	102.6
2020-110-04	08-Oct-20	14:51	2930	<0.32	<120	1690	0.33	95.9
2020-040-20	12-Oct-20	15:02	2740	0.449	108.3	1370	1.25	98.54
2020-040-T01	09-Oct-20	16:47	2830	0.35	88	1620	0.75	95.9
2020-040-19	14-Oct-20	13:22	2810	0.386	110.6	860	2.546	97.44
2020-040-T02	16-Oct-20	14:55	2640	0.63	<120	1500	0.89	97.4
2020-040-21	19-Oct-20	14:51	2800	<0.32	<120	1500	0.883	95.52
2020-040-T03	22-Oct-20	14:51	2660	0.489	<88	1420	1.151	90.46
2020-110-05	23-Oct-20	14:49	2950	<0.32	<120	1850	0.43	103.5
2020-030-01	27-Oct-20	14:52	2720	0.788	<.88	1510	2.11	103.3
2020-040-T04	30-Oct-20	15:00	2810	0.599	91.05	1660	1.46	105.6
2020-040-T06	30-Oct-20	15:00	2730	0.599	91.05	1740	1.46	105.6
2020-030-02	05-Nov-20	14:52	2730	0.709	94.44	1530	0.891	90.46
2020-040-T05	06-Nov-20	14:55	2760	0.828	<120	1690	0.686	95.41
2020-030-03	11-Nov-20	14:50	2690	0.591	<120	1470	1.69	91.6
2020-030-04	19-Nov-20	15:54	2750	0.607	<88	1470	1.348	97.79
2020-030-05A	20-Nov-20	16:00	2775	<0.32	<120	1490	1.63	96.4

Table 3 - 2020 Open Pit Blast Monitoring Data

			Location					
			7212 Moose River Road			Cabin in the woods		
Blast Number	Date	Time	Distance (m)	PPV (mm/sec)	SBL (dB)	Distance (m)	PPV (mm/sec)	SBL (dB)
2020-030-05B	23-Nov-20	14:39	2810	0.378	98.78	1460	1.474	101.6
2020-030-07	25-Nov-20	14:55	2710	1.23	<88	1540	1.002	101.9
2020-040-T06	23-Nov-20	14:39	2810	0.378	98.78	1460	1.474	101.6
2020-040-T08	20-Nov-20	16:00	2775	<0.32	<120	1490	1.63	96.4
2020-040-T09	26-Nov-20	14:48	2680	0.78	88.4	1580	0.66	100.4
2020-110-06	27-Nov-20	12:59	2940	<0.32	<120	1770	<0.32	<120
2020-025-01	03-Dec-20	14:55	2710	0.599	90.86	1450	1.482	96.07
2020-030-06	03-Dec-20	14:55	2720	0.599	90.86	1410	1.482	96.07
2020-040-T10	04-Dec-20	14:54	2730	<0.32	<120	1410	0.828	94.19
2020-030-09	05-Dec-20	13:01	2780	0.449	98.78	1480	1.43	102
2020-030-08	07-Dec-20	14:51	2760	<0.32	<120	1450	1.269	91.6
2020-030-08B	10-Dec-20	15:00	2170	0.402	96	1430	1.49	95.5
2020-030-11	11-Dec-20	14:56	2720	0.63	94	1560	1.05	101.9
2020-040-T11	11-Dec-20	14:56	2840	0.63	94	1500	1.05	101.9
2020-030-12	15-Dec-20	14:53	2740	0.78	96.68	1600	0.772	98.7
2020-110-06	17-Dec-20	14:38	2980	<0.32	<120	1870	<0.32	<120
2020-030-13	22-Dec-20	14:56	2770	0.741	<88	1560	1.245	88.16
2020-110-T01	24-Dec-20	13:30	2950	<0.32	<120	1710	<0.32	<120
2020-030-14	30-Dec-20	15:12	2780	0.434	91.24	1530	1.119	100
2020-030-T01	31-Dec-20	13:28	2650	0.899	<88	675	1.442	106.7

* Blast monitoring data was recorded at Higgins Mines RD Pit.

Table 4 Daily Average TMF Inputs and Outputs

Month	Wet Tailings Volume (m ³ /day)	Dry Tailings Volume (Tonnes/day)	Tailings Recycle Water (m ³ /day)	Fresh Water Makeup Volume (m ³ /day)	Treated Water Discharged Volume (from FDP) (m ³ /day)
Jan-20	12,703	7,339	9,380	382	-
Feb-20	13,305	7,667	9,777	349	-
Mar-20	13,535	7,842	9,574	388	3,562
Apr-20	12,877	7,887	8,970	346	12,738
May-20	11,351	7,068	8,079	419	12,117
Jun-20	11,848	7,514	8,787	477	5,537
Jul-20	11,304	7,408	8,337	401	-
Aug-20	12,062	7,748	8,960	364	-
Sep-20	12,255	7,600	8,999	419	276
Oct-20	12,641	7,792	9,149	316	5,588
Nov-20	12,173	7,571	8,602	379	7,465
Dec-20	11,841	7,898	8,288	327	6,513

Table 5 Monthly Total TMF Inputs and Outputs

Month	Historical Tailings (Tonnes)	Wet Tailings Volume (m ³)	Dry Tailings Volume (Tonnes)	Tailings Recycle Water (m ³)	Fresh Water Makeup Volume (m ³)	Treated Water Discharged Volume (from FDP) (m ³)
Jan-20	-	393,783	227,503	290,776	11,838	-
Feb-20	-	385,847	222,332	283,531	10,124	-
Mar-20	-	419,596	243,104	296,808	12,014	110,409
Apr-20	-	386,308	236,599	269,100	10,384	382,152
May-20	-	351,890	219,109	250,452	12,976	375,623
Jun-20	-	355,437	225,406	263,596	14,322	166,104
Jul-20	-	350,437	229,660	258,457	12,434	-

Month	Historical Tailings (Tonnes)	Wet Tailings Volume (m ³)	Dry Tailings Volume (Tonnes)	Tailings Recycle Water (m ³)	Fresh Water Makeup Volume (m ³)	Treated Water Discharged Volume (from FDP) (m ³)
Aug-20	-	373,936	240,194	277,757	11,271	-
Sep-20	-	367,664	228,000	269,972	12,570	8,284
Oct-20	-	391,872	241,545	283,612	9,806	173,2310
Nov-20	-	365,201	227,128	258,071	11,365	223,963
Dec-20	-	367,076	244,827	256,923	10,127	201,903

Table 6: AMNS 2020 Seepage Pond Dewatering Rate Calculations

Calendar period	2020-01-02 to 2020-12-31
Total number of days in calendar period	364
*Total volume pumped from the West TMF seepage pond over calendar period (m ³)	399,068
*Total volume pumped from the East TMF seepage pond over calendar period (m ³)	172,956
Dewatering flow rate for West TMF seepage pond (m ³ /day)	1,090.35
Dewatering flow rate for East TMF seepage pond (m ³ /day)	472.56

*Includes surface runoff from the pond catchment areas, surface water inflow from natural wetland areas surrounding the TMF, groundwater inflow and seepage from the tailings facility.

Table 7: AMNS 2020 Rainfall Event Monitoring Summary

Date	Check Type	Forecasted Rainfall (mm) ^A	Recorded Site Total Precipitation (mm) ^B	Recorded Airport Total Precipitation (mm) ^C	Observed Weather Details	Water bodies clear? (Y/N)	Observations/Actions	Issues/Response
2020-08-05	Rain	N/A – Not recorded.	N/A - device malfunction	18.6	Rain	Y	No concerns identified.	No visible inputs observed.
2020-08-17	Rain	3-5 mm; 1 mm per hour	N/A - device malfunction	23.6	Light rain	Y	All ponds were pumping or on standby. No areas of concern noted.	All checked points clear. No visible input or potential for input. No areas of potential concern noted
2020-08-25	Rain	Approximately 5 mm overnight	N/A - device malfunction	12.6	Light rain and overcast	Y	Southwest seepage pond in TMF was high, radioed ALVA to pump. No areas of concern noted.	All checked points clear. No visible input or potential for input. No areas of potential concern noted.
2020-08-28	Pre-Rain	20-25 mm Saturday overnight to Sunday	0	N/A	Sunny, 20°	Y	Pumps on standby at all ponds. West TMF ponds currently locked out due to dam construction but will be operating by end of shift. Scraggy stockpile	All checked points clear. No visible input or potential for input. Low flow conditions. No areas of potential concern noted.

Date	Check Type	Forecasted Rainfall (mm) ^A	Recorded Site Total Precipitation (mm) ^B	Recorded Airport Total Precipitation (mm) ^C	Observed Weather Details	Water bodies clear? (Y/N)	Observations/Actions	Issues/Response
							collection pond prepared with pump, hay and silt fence. Followed up with Mine ops to confirm prep.	
2020-08-29	Rain	N/A	N/A - device malfunction	20.6	Overcast, fog, mist	Y	All collection ponds pumped low to empty. No areas of concern noted.	All checked points clear. No visible input or potential for input. No areas of potential concern noted. Low flow conditions.
2020-09-03	Pre-Rain	5 to 10 mm	0	N/A	light rain	Y	SW-SCP3 level high, had pumped down. No other areas of concern noted.	SW23 clear but the downstream side has an orange colour and was slightly cloudy. All checked points clear. No visible input or potential for input. No areas of potential concern noted.
2020-09-03	Rain	5 to 10 mm	N/A - device malfunction	8.4	Rain, heavy at times, ending at 13:30	Y	Scraggy stockpile pond low. No areas of concern noted.	Later checked DS of SW23, took a sample with a clear glass jar and determined it was colour, not sediment.
2020-09-04	Rain	N/A	N/A - device malfunction	2.6	Light rain in morning	Y	No concerns identified.	All checked points clear. No visible input or potential for input. No areas of potential concern noted.
2020-09-21	Pre-Rain	30-40 mm - Hurricane Teddy	0	N/A	Sunny, Clear, 15°	Y	Management meetings held throughout the day to prepare all departments for incoming hurricane. Stantec onsite to inspect ESC infrastructure. Sediment pond to be cleaned out in preparation.	All checked points clear. Several road washouts identified on Public road by Watercourse 4. No visible input or potential for input. No areas of potential concern noted.
2020-09-22	Pre-Rain	30-40 mm - Hurricane Teddy	0	N/A	Cloudy, high winds	Y	Ponds pumped low except WRSP2 but was being pumped. Placed hay with Mine Ops at Alva gate and Northeast WRSA ditch.	All checked points clear. Placed hay by Moose River Road washouts as a preventative measure.
2020-09-22	Rain	30-40 mm - Hurricane Teddy	N/A - device malfunction	51	Rain, at times heavy, beginning around 11:00, stopped between 12:00 to 13:00	Y	All ponds pumping, WRSA sediment pond high but pumping. No other areas of concern noted.	All checked points clear. Brown silt observed on public dirt road near SW-3 and draining toward watercourse, clear upstream of road where site runoff enters watercourse #4. No other areas of potential concern noted
2020-09-23	Rain	20-25 mm - Hurricane Teddy	N/A - device malfunction	37.8	Steady rain overnight and throughout day	Y	All ponds low or pumping. No areas of concern noted.	All checked points clear. No visible input or potential for input. No areas of potential concern noted
2020-10-06	Pre-Rain	10-15 mm overnight	0	4.6	Rain overnight into morning	Y	All pumps on standby, recent work completed on Waste Rock Haul Rad (new rock laid). No areas of concern noted.	All checked points clear. No visible input or potential for input. No areas of potential concern noted

Date	Check Type	Forecasted Rainfall (mm) ^A	Recorded Site Total Precipitation (mm) ^B	Recorded Airport Total Precipitation (mm) ^C	Observed Weather Details	Water bodies clear? (Y/N)	Observations/Actions	Issues/Response
2020-10-07	Rain	Rain overnight, anticipated rain 13:00-16:00	5.8	22.8	Sunny	Y	All sediment ponds pumped low, all TMF seepage ponds at operating level (orange line) with no pumps pumping. Spoke to Alva and ponds were pumped. No other areas of concern noted.	All checked points clear. No visible input or potential for input. No areas of potential concern noted
2020-10-13	Pre-Rain	25-30 mm overnight	0	N/A	Sunny	Y	Catchment ponds and ditching along ROM Road cleaned out. All ponds pumping or low. No areas of concern noted.	All checked points clear. No visible input or potential for input. No areas of potential concern noted
2020-10-14	Rain	30-45 mm	46.5	46	Rain overnight into all day	N	All ponds pumping. Pump on WRSA Sediment pond turned off to limit flow into Emergency spill pond. No Alva haul traffic on TMF Haul Road and limited Hauling on WRSA haul Road.	<p>Rain check 1: at 8:00 WC4CULA and WC4CULB were both clear, no areas of concern noted.</p> <p>Rain check 2: at 10:00 SW23, WC4CULA were clear, but input observed at WC4CULBUS, left of culvert when looking upstream. Immediately notified Mine Ops Superintendent and Environment Supervisor. Samples taken and Regulators notified.</p> <p>Rain Check 3: at 14:40 the input was observed again. Notified Mine-Ops and Environment and laid hay/coir logs. Collected samples and regulators notified.</p> <p>Further details in Incident Report.</p>
2020-11-02	Rain	N/A – not recorded.	49.5	38.6	N/A – not recorded	N	All ponds checked. Surface runoff from west side of Scraggy stockpile not being captured by newly constructed ditch. Mine-Ops was notified and will remove berm blocking access to ditch. Significant ponding also observed along public road east of Stockpile near SW3. Area discussed with Environment Superintendent and memo will be sent out to staff to limit travel on road.	<p>Observed small amount of silt input in watercourse 4 at WC4CULBUS. Samples taken and regulators notified. All other waterbodies visually clear.</p> <p>Further details in Incident Report.</p>
2020-11-12	Pre-Rain	10-15 mm overnight	0	5.5	Overcast, 16°	Y	Haul roads clear of ponded water, WRSA sediment pond recently cleaned. No areas of concern noted.	All checked points clear. No visible input or potential for input. No areas of potential concern noted.
2020-11-13	Rain	10-15 mm overnight Thursday	4.6	6.1	Overcast, not raining	Y	All TMF ponds pumped low, all pond below operating levels. No areas of concern. Less rain than forecasted.	All checked points clear. No visible input or potential for input. No areas of potential concern noted.
2020-11-15	Pre-Rain	20-25 mm over next 24 hours	0.3	0	Sunny, 0°	Y	All TMF pond below operating level, Emergency dump pond below operating level. No areas of concern noted.	All checked points clear. No visible input or potential for input. No areas of potential concern noted.
2020-11-16	Rain	20-25 mm	23.1	23.6	Rain	N	Additional clay placement along the north side of the TMF haul road. Clay berms were constructed to divert surface water from the TMF haul road to Emergency Dump Pond.	<p>Observed small silt input in watercourse 4, upstream of culvert B at 10:56 am. Watercourse was clear during initial checks at 8:00 and 9:00 am.</p> <p>Further details in Incident Report.</p>

Date	Check Type	Forecasted Rainfall (mm) ^A	Recorded Site Total Precipitation (mm) ^B	Recorded Airport Total Precipitation (mm) ^C	Observed Weather Details	Water bodies clear? (Y/N)	Observations/Actions	Issues/Response
2020-11-23	Pre-Rain	"1 mm morning/afternoon, 15-20 mm evening, 10-15 mm overnight	0	21.4	Overcast	Y	Recent work done on TMF Haul Road by Watercourse 4: new rock laid and graded on berm; clay placed along berm. All ponds pumped low. No areas of concern noted.	All checked points clear. No visible input or potential for input. No areas of potential concern noted.
2020-11-24	Rain	15-20 mm evening	37.6	0.4	Overcast, 0°	N	Minimal ponding on TMF haul road, TMF ponds pumped or low. No areas of concern noted.	Input of brown discoloured water at northwest corner to Scraggy Lake, source and cause was unknown at the time of observation. ECCC also on Site for inspection and observed the input. Staff followed water flow through drainage course behind cabin. Samples taken and regulators notified. Further details in Incident Report.
2020-11-26	Rain	10-15 mm overnight"	1.8	5.6	Light rain, 7°	Y	All ponds pumping: SWSCP2 high but pumping, Sed Pond 1 high due to pump failure but new pump brought in. Some water ponding on TMF haul road. No other areas of concern noted.	All checked points clear. No visible input or potential for input. No areas of potential concern noted.
2020-11-27	Rain	10 mm throughout day	7.4	6.8	Light drizzle	Y	All ponds pumped. No areas of concern noted. Intense rainfall that was forecasted wasn't observed.	All checked points clear. No visible input or potential for input. No areas of potential concern noted.
2020-12-01	Pre-Rain	15 mm overnight	0.5	4.6	Overcast, 11°	Y	Minimal ponding on TMF haul road, berm cutouts on Admin Road replaced before rainfall. Installed silt fencing and coir logs along Scraggy Lake Drainage. No areas of concern noted.	All checked points clear. No visible input or potential for input. No areas of potential concern noted.
2020-12-02	Rain	-	19.8	7.6	Light drizzle and rain all day	Y	Laid hay at borehole BH20-01 as preventative precaution, area has little to no sedimentation. Ponded water by clay placed on TMF haul road.	All checked points clear. No areas of potential concern noted in morning. Minor amount of silt observed by Admin Road near borehole location, additional hay bales and coir log placed. NO silt in wetland or watercourses, visible input or potential for input. No other areas of potential concern noted.
2020-12-04	Pre-Rain	15-20 mm following day	0.2	1.5	Cloudy, 10°	Y	Spoke to Mine Ops about TMF ponds, plan is to fully pump down at end of day. TMF stockpile also inspected. No areas of concern noted.	All checked points clear. No visible input or potential for input. No areas of potential concern noted.
2020-12-05	Rain & Pre-Rain	15 – 20 mm throughout day	18.8	32.8	Little to no rain	Y	All ponds pumped low or pumping. No issues with new TMF berm work. Geology contacted Enviro for sediment control support, hay laid to stabilize slurry from drill work. Laid 3 bails with geotextile and laid hay on exposed sediment from tracked equipment.	No visual indications that sedimentation has occurred on site and no areas of concern noted.
2020-12-06	Rain	10-15 mm overnight	10.9	1.6	Light drizzle, 5°	Y	Checked Borehole locations along Admin Rd. Some siltation noted but captured by hay. No issues with TMF stockpile. No pump located at pond on MRR,	All checked points clear. No visible input or potential for input. No areas of potential concern noted.

Date	Check Type	Forecasted Rainfall (mm) ^A	Recorded Site Total Precipitation (mm) ^B	Recorded Airport Total Precipitation (mm) ^C	Observed Weather Details	Water bodies clear? (Y/N)	Observations/Actions	Issues/Response
							notified Mine-ops and had it re-installed and pumped.	
2020-12-12	Pre-Rain	5-10 mm	0.3	4.6	Overcast, 0°	Y	All ponds low or pumping. Minimal ponding on Haul Roads. Additional hay bales in place at Scraggy Lake (Scraggy Lake Drainage), Minimal ponding on TMF haul road, pond pumped or low. No areas of concern noted.	All checked points clear. No visible input or potential for input. No areas of potential concern noted
2020-12-13	Rain	10-15 mm overnight	14.5	12.4	Misting	Y	Ponds pumped or pumping. East seeping pond high but Mine-Ops notified and turned on pump. Construction activities noted at spillway near Engineered wetland, but no runoff observed. No other areas of concern noted.	Scraggy Drainage clear, no runoff visible from ENG-WL work. All checked points clear. No areas of potential concern noted
2020-12-20	Pre-Rain	15-20 mm Monday	0	0.7	Clear	Y	Ponds either pumped or high but will be pumped when temperature is warmer/before rainfall. Pumps now winterized. No areas of concern noted.	All checked points clear. No visible input or potential for input. No areas of potential concern noted.
2020-12-21	Rain	25-50 mm	24.1	20.2	Rain, 3°	N	Multiple ponds were med-high and not pumping during initial inspections. Ponds were iced over and hoses for pumps were frozen. Mine Ops had everything under control by late morning as rain dissipated. Minor sediment release observed during third inspection, both pumps at the emergency dump pond were running at the time.	Watercourses clear for first 2 inspections. Minor sediment release observed at WC4 Culvert B at 14:15. Mine-Ops and Environment notified; samples were taken. Regulators notified. Further details in Incident report.
2020-12-22	Rain	Continuation of 25-50 mm event	6.1	2.4	Overcast, 3°	Y	Follow up TSS sample taken at WC4CULBDS. No further input, all watercourses and waterbodies clear. West TMF ponds at max operating level.	All checked points clear. No visible input or potential for input. No areas of potential concern noted.
2020-12-25	Pre-Rain	10-15 mm on Dec. 26	0	0.4	Partly cloudy, 12°	Y	All ponds low or pumping. Pumps ready to go. No areas of concern noted.	All checked points clear. No visible input or potential for input. No areas of potential concern noted.
2020-12-26	Rain	10-15 mm	8.4	9	Light rain, high winds	Y	All ponds low or pumping. Pump on Admin Road (Sed Pond 1) was not working and fixed mid-day. Silt curtain in Scraggy Lake washed closer to shore due to high winds.	All checked points clear. No visible input or potential for input. No areas of potential concern noted.
2020-12-29	Rain	5-10mm	9.9	8.1	Rain, overcast	N	Emergency spill pond pumping. No ponding on Haul Roads, West seepage ponds were high (below max level) and not pumping. Mine Ops was on way into TMF at 12pm to pump.	Minor sediment release observed at WC4 Culvert B at 10:30. Mine-Ops and Environment notified, and samples taken. Regulators notified. All other waterbodies clear. Further details in Incident Report.
2020-12-31	Rain	5-10 mm	2.032	1.3	Light drizzle, overcast, high winds	N	Sed Pond 1 and emergency dump pond high but pumping. Dewatering bolt in pipeline above WC4 had come out due to pressure, resulting in water leaking from line. Mine Ops notified and	Input observed at WC4 culvert B at 9:15 due to the water leaking from above pipeline. Mine Ops and Environment notified; samples taken. Regulators notified. All other waterbodies clear.

Date	Check Type	Forecasted Rainfall (mm) ^A	Recorded Site Total Precipitation (mm) ^B	Recorded Airport Total Precipitation (mm) ^C	Observed Weather Details	Water bodies clear? (Y/N)	Observations/Actions	Issues/Response
							immediately replaced bolt. No other areas of concern noted.	Further details in Incident Report.

Notes:

A: Rainfall forecast data is recorded by AMNS staff during daily toolboxes and pre-rain checks based on review of online weather data provided by the Weather Network for the Moose River Gold Mines Provincial Park location.

B: Based on onsite weather station data.

C: Rainfall totals were taken from the Environment Canada Halifax Stanfield International Airport weather station (Climate ID 8202251) due to a malfunction with the onsite weather station.

D: Checkpoints is defined further in Section 8.0

Table 8: AMNS 2020 High Flow Monitoring

Sample ID	Date	Time	Temp (°C)	DO	Conductivity (µS)	TDS (ppm)	salinity (ppt)	pH	ORP	Turbidity	Total Suspended Solids (mg/L)	Notes
SW-23	2020-07-09	10:00	11.3	7.3	39.9	35.132	0.02	5.19	188.3	1.6	82 ^A	Completed after a 20-25 mm rain event.
WC4 A	2020-07-09	10:10	13.8	9.6	346.1	286.538	0.21	6.8	103	2.7	3.0	
WC4 B	2020-07-09	10:10	12.4	10.4	357.5	305.971	0.23	6.63	94.3	4	4.6	
WC4 D	2020-07-09	10:30	14.5	9.0	548	445.422	0.34	6.69	137.9	22.3	3.8	
SW-3	2020-07-09	12:30	16.8	8.32	475.8	366.923	0.27	4.7	36.8	5.7	6.4	
SW-23	2020-11-24	8:10	5.9	8.87	41.1	42.058	0.03	4.31	235.2	3	2.4	Completed after a 15-20 mm rain event.
WC4 A	2020-11-24	8:27	6.2	10.93	144.7	146.711	0.11	6.85	118.8	10	4.4	
WC4 B	2020-11-24	8:44	6	12.07	153.1	156.41	0.11	7.74	128	9.1	4.8	
WC4 D	2020-11-24	8:54	5.8	11.46	176.9	181.697	0.13	7.65	135.6	16.7	5.6	
SW-3	2020-11-24	13:46	5.7	11.87	176.3	181.402	0.13	5.38	110.8	14.9	6.8	

Notes:

A: SW-23 is a background location. This result is believed to be attributed to sampling or lab error.

Appendix C

Reports

Appendix C.1

2020 Annual Report Surface & Groundwater Monitoring (submitted under separate cover)

Appendix C.2

Ambient Air Quality Monitoring Program 2020 Final Report



**2020 Ambient Air Monitoring Program
Touquoy Gold Project
Moose River, Halifax County, NS**

FINAL REPORT

Submitted to:

Atlantic Mining NS Inc.
Middle Musquodoboit, Nova Scotia

Submitted by:

Wood Environment & Infrastructure Solutions
Dartmouth, Nova Scotia

April 2021

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1.0 INTRODUCTION

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited (Wood), is pleased to provide Atlantic Mining NS Inc. with this data summary report documenting the methodology and results of the 2020 Touquoy Gold Mine Ambient Air Monitoring Program (AAMP). The program was conducted over a seven-day period to support environmental effects monitoring in compliance with the Terms and Conditions of the Industrial Approval (No. 2012-084244). Under this permit, the monitoring requirements for particulate emissions (dust) are as follows:

- a. *Particulate emission shall not contribute to an ambient concentration of total suspended particulate matter that exceed the following limits (in micrograms per cubic metre of air) at or beyond the Site property boundaries:*

Annual Geometric Mean: 70 ug/m³

Daily Average (24 hr.): 120 ug/m³

- b. *i) The Approval Holder shall establish six ambient air monitoring stations for the total suspended particulate. Stations situated as identified in drawing Dwg. 1 (refer to Attachment "A"), entitled "Particulate Emission Monitoring Locations, Nova Scotia Industrial Approval, Touquoy Mine Tailings Management Facility, Halifax, Nova Scotia, Atlantic Mining NS Corp., prepared by Stantec, February 15, 2017".*

ii) These stations shall be monitored annually through out construction, operation and reclamation, during July – August, including periods of Facility dormancy.

iii) Suspended particulate matter shall be measured by the EPA standard; EPA/625/R-96/010a; Sampling of Ambient Air for Total Suspended Particulate Matter (SPM) and PM10 Using High Volume (HV) Sampler.

To address the above Approval requirements, an AAMP was implemented with sampling for Total Suspended Particulate (TSP) performed at the six locations identified in the Industrial Approval. The sampling was performed early to mid-August. In addition to TSP, analyses for arsenic and mercury (particulate fraction) were also performed on the samples.

The additional analyses were performed in response to a requirement for Atlantic Mining NS Inc. to assess metal concentrations at ground level at the site boundary as per section 6. a. of the IA:

The Approval Holder shall ensure that emissions from the facility do not contribute to an exceedence of the maximum permissible ground level concentrations specified in Schedule "A" of the Air Quality Regulations.

2.0 PROGRAM DESCRIPTION

2.1 FIELD PROGRAM METHODOLOGY

Eight consecutive sampling events were conducted from 7 August 2020 to 14 August 2020, using Total Suspended Particulate (TSP) High Volume samplers operating at, or near, the six locations identified in the Nova Scotia Industrial Approval. A site map outlining the sampler configuration is provided in Appendix A, and pictures of each sampling location are in Appendix B. Twenty-four hour samples were collected at each of the six locations for seven consecutive days. For one of the locations (Location 5), sampling could not be completed on two of the days due to a generator failure. An additional sample was collected at this location on day eight. A total of 41 samples were collected during the program.

All sampling was conducted in accordance with the EPA standard *EPA/625/R-96/010a – Sampling of Ambient Air for Total Suspended Particulate Matter (SPM) and PM10 Using High Volume (HV) Sampler*. Tisch High Volume samplers were used. All samplers were calibrated using an orifice and a digital manometer. Sampling was performed from approximately midnight to midnight each day. Initial, intermediate, and final flow checks were verified for each sampler during each 24-hour sampling period. The TSP High Volume samplers were powered using gas fired generators (except for Location 1, which had dedicated power). Based on a review of the previous annual programs and projected prevailing daily winds, the gas generators were located downwind of each sampler.

Table 2-1 provides a list of the parameters monitored at each location over the course of the monitoring program.

Table 2-1: Summary of the Air Monitoring Program

Monitoring Stations	Location Description	Sampling Period	Number of Samples	Parameters
TSP 1	Located approximately 13 m southwest of the gravel shoulder paved road at civic address 6719 Moose River Road (MRR). MRR was paved in late 2019 and is currently the public road that is used by both mine and public traffic. The sampler was located in a grassed area. A gravel parking lot was located NW of the location and a gravel driveway adjacent to the sampler.	7 Aug – 13 Aug	7	TSP, mercury ⁽¹⁾ , arsenic

TSP 2¹ (listed as TSP 3 in the IA)	Located approximately 100 m from the open pit. The sampler was placed adjacent to the divergence of the gravel detour road from Higgins Mines Rd, backed by low lying ferns and grasses. A gate separates the grassy area from the periphery of the open pit expansion.	7 Aug – 13 Aug	7 (+1 field blank)	TSP, mercury ⁽¹⁾ , arsenic
TSP 3 (listed as TSP 2 in the IA)	Located approximately 40 m north of Mooseland Road (MLR), in the grass beside a former gravel haul road. The sampler was placed approximately 100 m west of the present Haul Road.	7 Aug – 13 Aug	7	TSP, mercury ⁽¹⁾ , arsenic
TSP 4	Located approximately 6 m from the west side of MRR and approximately 1.95 km NW of the open pit. The sampler was placed in a gravel ditch overgrown with grass and wildflowers. This location is considered a background location which would be considered representative of the airshed without the influence of the mine site. This portion of MRR is newly re-paved road and is used by the public.	7 Aug – 13 Aug	7	TSP, mercury ⁽¹⁾ , arsenic
TSP 5	Located approximately 8 m from the south side of MLR, amongst low shrubs. The sampler was approximately 0.75 km NE of the Tailings Management Facility (TMF). This portion of MLR is currently an unpaved, gravel road and mostly used by public traffic.	7 Aug – 14 Aug	6	TSP, mercury ⁽¹⁾ , arsenic
TSP 6	Located at the end of a gravel detour route, approximately 50 m from the TMF, and 40 m from a stockpile. The area is grassy, with gravel patches and appears undisturbed. No local or mine traffic was observed at this location.	7 Aug – 13 Aug	7	TSP, mercury ⁽¹⁾ , arsenic
Total			41 (+ 1 field blank and + 1 trip blank)	

Note: (1) Mercury sampling only included the particulate fraction.

¹ The locations for TSP 2 and TSP 3 are inverted in this report relative to the location numbers in the Industrial Approval. These will be corrected in subsequent monitoring events.

All identified locations were sampled in August, when weather conditions are typically the driest, as per the NSE Industrial Approval (IA). The number of sampling events will provide a well-defined snapshot of the site conditions at the time of sampling. It is noted that sampling has been completed in July/Aug period in the past; permission was granted by NSE on July 16, 2020 to sample in August of 2020.

2.2 LAB ANALYSIS METHODOLOGY

Quartz filters were used to capture TSP and metals. The filters were collected and placed immediately into manila envelopes at approximately midnight for each 24-hour cycle. All samples were submitted to AGAT Laboratories in Dartmouth, NS, following the QA/QC program outlined in Section 3.2, for the analysis of TSP, mercury (particulate fraction), and arsenic. Analyses were performed in general accordance with *USEPA Compendium Method IO-3.5 Determination of Metals in Ambient Particulate Matter Using Inductively Coupled Plasma/Mass Spectrometry (ICP/MS)* (USEPA, June 1999).

2.3 FIELD OBSERVATIONS

Except for Location 5, the program was conducted from approximately midnight to midnight for seven consecutive sampling events from August 7th – August 13th, 2020. Due to equipment problems at Location 5 on both August 11th and 12th, sampling was extended to August 14th at this location. Table 2-2 provides a summary of field observations for the sampling events at each location, as well as general conditions and activity level at the TMF and/or Open Pit for each day of the program.



Table 2-2: Summary of Field Observations

Location	7-Aug-2020 Observations	8-Aug-2020 Observations	9-Aug-2020 Observations	10-Aug-2020 Observations	11-Aug-2020 Observations	12-Aug-2020 Observations	13-Aug-2020 Observations	14-Aug-2020 Observations
TSP1	11:26 hours <ul style="list-style-type: none"> No vehicles in area Light dust observed near look off area 23:40 hours <ul style="list-style-type: none"> No traffic other than AAMP vehicles 	10:52 hours <ul style="list-style-type: none"> Light traffic (cars) Little to no wind No visible dust 23:31 hours <ul style="list-style-type: none"> No traffic No visible dust or pollen observed 	11:36 hours <ul style="list-style-type: none"> No wind No visible dust or pollen observed No traffic observed 23:28 hours <ul style="list-style-type: none"> Slight breeze No traffic No visible dust or pollen 	11:01 hours <ul style="list-style-type: none"> No wind No visible dust or pollen observed No traffic observed 23:16 hours <ul style="list-style-type: none"> No wind or visible dust observed No traffic 	11:32 hours <ul style="list-style-type: none"> No visible dust No traffic observed 23:34 hours <ul style="list-style-type: none"> No visible dust No traffic observed 	12:48 hours <ul style="list-style-type: none"> No visible dust No traffic observed 23:26 hours <ul style="list-style-type: none"> No visible dust No traffic observed 	11:19 hours <ul style="list-style-type: none"> No visible dust or pollen observed No traffic observed 23:33 hours <ul style="list-style-type: none"> No visible dust or pollen observed No traffic observed 	N/A
TSP2	11:15 hours <ul style="list-style-type: none"> No vehicles No visible dust Excavator and drill rig in pit Light wind 23:23 hours <ul style="list-style-type: none"> No traffic other than AAMP vehicles No dust observed Pit operations ongoing 	23:03 hours <ul style="list-style-type: none"> Activity in pit No traffic No visible dust or pollen Light wind 23:15 hours <ul style="list-style-type: none"> No traffic Heavy equipment operating in pit 	11:28 hours <ul style="list-style-type: none"> No wind No public traffic No visible dust 23:17 hours <ul style="list-style-type: none"> No traffic other than AAMP vehicles No visible dust or pollen observed No activity in the pit (break time) 	10:52 hours <ul style="list-style-type: none"> Light wind No public traffic No visible dust 23:02 hours <ul style="list-style-type: none"> Light wind No public traffic No visible dust No activity in the pit 	11:25 hours <ul style="list-style-type: none"> Heavy duty vehicles in pit; three light vehicles. No visible dust Prepping pit for blast 23:21 hours <ul style="list-style-type: none"> Light NW wind Prepping pit for blast with heavy equipment Three light vehicles 	12:42 hours <ul style="list-style-type: none"> No visible dust No traffic observed 23:17 hours <ul style="list-style-type: none"> No visible dust No traffic observed No activity in the pit 	11:11 hours <ul style="list-style-type: none"> No visible dust or pollen observed No traffic observed No activity in the pit 23:13 hours <ul style="list-style-type: none"> No visible dust or pollen observed No traffic observed No activity in the pit 	N/A
TSP3	11:31 hours <ul style="list-style-type: none"> One haul truck observed and light traffic on MLR. Visible light dust from pit 23:55 hours <ul style="list-style-type: none"> 3 haul trucks on Haul Rd. 	11:02 hours <ul style="list-style-type: none"> Light wind and dust observed Haul truck traffic at crossing (Haul Road and MLR) Light public traffic 23:48 hours <ul style="list-style-type: none"> 2 haul trucks noted along the Haul Rd Visible dust observed along the Haul Road 	11:41 hours <ul style="list-style-type: none"> Light wind. Light vehicle traffic on MLR. Dust plumes on MRR haul crossing only; low dust on haul roads (water truck operating) 23:40 hours <ul style="list-style-type: none"> Haul trucks on haul road, light vehicle traffic on MRR No visible dust 	11:06 hours <ul style="list-style-type: none"> Six haul trucks and light trucks observed. Wind increasing. 23:27 hours <ul style="list-style-type: none"> No activity observed 	11:35 hours <ul style="list-style-type: none"> Six haul trucks, one light vehicle observed 23:44 hours <ul style="list-style-type: none"> Haul trucks visible. No dust observed 	12:52 hours <ul style="list-style-type: none"> No visible dust No traffic observed No haul trucks 23:45 hours <ul style="list-style-type: none"> No visible dust No traffic observed No haul trucks observed. 	11:24 hours <ul style="list-style-type: none"> Light traffic on MLR No visible dust or pollen 23:40 hours <ul style="list-style-type: none"> No visible dust or pollen observed No traffic observed No activity in the pit 	N/A
TSP4	10:42 hours <ul style="list-style-type: none"> No traffic No dust observed Light wind 22:41 hours <ul style="list-style-type: none"> No traffic other than AAMP vehicles Visible pollen in area. Winds calm 	10:19 hours <ul style="list-style-type: none"> Little wind, no traffic on MRR. No visible dust noted 22:34 hours <ul style="list-style-type: none"> No activity in pit No visible dust 	11:08 hours <ul style="list-style-type: none"> Mild public traffic No visible dust Light wind. 22:41 hours <ul style="list-style-type: none"> No traffic other than AAMP vehicles No visible pollen 	10:30 hours <ul style="list-style-type: none"> Light vehicle traffic on MRR. No dust or pollen observed Light wind 22:26 hours <ul style="list-style-type: none"> No vehicle traffic. No visible dust 	10:49 hours <ul style="list-style-type: none"> Light vehicle traffic including AAMP vehicles No dust observed 22:45 hours <ul style="list-style-type: none"> No vehicle activity other than AAMP vehicles No dust observed 	11:54 hours <ul style="list-style-type: none"> No visible dust Light traffic observed on MRR. 22:35 hours <ul style="list-style-type: none"> No vehicle activity other than AAMP vehicles No dust observed 	10:50 hours <ul style="list-style-type: none"> No visible dust Light traffic observed on MRR 22:39 hours <ul style="list-style-type: none"> No vehicle activity other than AAMP vehicles. No dust observed 	N/A



Location	7-Aug-2020 Observations	8-Aug-2020 Observations	9-Aug-2020 Observations	10-Aug-2020 Observations	11-Aug-2020 Observations	12-Aug-2020 Observations	13-Aug-2020 Observations	14-Aug-2020 Observations
TSP5	11:41 hours <ul style="list-style-type: none"> Minimal traffic Light wind No dust observed 00:19 hours <ul style="list-style-type: none"> No traffic other than AAMP vehicles 	11:09 hours <ul style="list-style-type: none"> Light public traffic No pollen or dust observed. Light wind. 00:46 hours <ul style="list-style-type: none"> Light traffic on MLR 	11:46 hours <ul style="list-style-type: none"> Moderate public traffic on MLR causing visible dust to be observed Low wind 23:55 hours <ul style="list-style-type: none"> No traffic other than AAMP No visible dust or pollen observed. 	11:15 hours <ul style="list-style-type: none"> No pollen or dust observed. No vehicle traffic on MRR 23:40 hours <ul style="list-style-type: none"> No pollen or dust observed. No vehicle traffic on MLR 	11:43 hours <ul style="list-style-type: none"> No vehicle activity other than AAMP vehicles No dust observed 00:05 hours <ul style="list-style-type: none"> Sampler failure, no observations 	13:01 hours <ul style="list-style-type: none"> No traffic on MRR No visible dust or pollen 00:00 hours <ul style="list-style-type: none"> Sampler failure, no observations 	11:30 hours <ul style="list-style-type: none"> No traffic on MLR No visible dust or pollen 22:57 hours <ul style="list-style-type: none"> No visible dust or pollen. No traffic on MLR 	12:30 hours <ul style="list-style-type: none"> No traffic on MLR No visible dust or pollen
TSP6	11:00 hours <ul style="list-style-type: none"> Light wind. Dam construction activity in TMF. 23:05 hours <ul style="list-style-type: none"> Site trucks at location No dust, traffic or activity observed 	10:33 hours <ul style="list-style-type: none"> Light wind No visible dust or pollen observed No vehicles in TMF 22:53 hours <ul style="list-style-type: none"> No activity in the TMF. No traffic other than AAMP vehicles No visible dust or pollen observed 	11:18 hours <ul style="list-style-type: none"> No visible dust or pollen observed. No traffic Light wind. 23:03 hours <ul style="list-style-type: none"> No traffic other than AAMP vehicles No visible dust or pollen observed. No activity in TMF (break time) 	10:45 hours <ul style="list-style-type: none"> No activity in TMF No visible dust or pollen observed. 22:47 hours <ul style="list-style-type: none"> No activity in TMF. No visible dust or pollen observed 	11:00 hours <ul style="list-style-type: none"> No activity in TMF No visible dust or pollen 23:05 hours <ul style="list-style-type: none"> No activity in TMF No visible dust 	12:32 hours <ul style="list-style-type: none"> No activity in TMF No visible dust or pollen 22:56 hours <ul style="list-style-type: none"> No activity in TMF No visible dust 	11:01 hours <ul style="list-style-type: none"> No activity in TMF No visible dust or pollen 23:00 hours <ul style="list-style-type: none"> No activity in TMF No visible dust 	N/A

2.4 METEOROLOGICAL INFORMATION

Information on wind speed, wind direction, temperature, relative humidity and precipitation was obtained from the Environment Canada weather station located at the Halifax International Airport, NS, approximately 50 km to the west of Moose River. Table 2-3 provides a summary of meteorological measurements for each day of the program. All measurements are recorded by Environment Canada on an hourly basis and have been averaged for this summary.

Table 2-3: Summary of Meteorological Information (2020)

Wind Direction (%)	7-Aug	8-Aug	9-Aug	10-Aug	11-Aug	12-Aug	13-Aug	14-Aug
N	--	20.83	--	--	--	--	12.5	12.5
NNE	--	--	--	--	--	--	4.17	4.17
NE	--	--	--	--	--	--	--	--
ENE	--	--	--	--	--	--	--	--
E	--	--	--	--	--	--	--	--
ESE	--	4.17	--	--	--	--	--	--
SE	--	--	--	--	--	--	--	--
SSE	--	12.5	--	--	--	--	--	--
S	--	29.17	--	20.83	33.33	54.17	12.5	12.5
SSW	12.50	16.67	29.17	29.17	66.67	45.83	8.33	8.33
SW	4.17	4.17	20.83	33.33	--	--	16.67	16.67
WSW	25.0	--	4.17	16.67	--	--	--	--
W	29.17	--	29.17	--	--	--	16.67	16.67
WNW	20.83	--	16.67	--	--	--	8.33	8.33
NW	4.17	4.17	--	--	--	--	16.67	16.67
NNW	--	8.33	--	--	--	--	4.17	4.17
Calm	4.17	--	--	--	--	--	--	--
Average Wind Speed (in km/hr) (m/s)	16.0 (4.4)	8.9 (2.5)	12.6 (3.5)	15.6 (4.3)	20.0 (5.6)	19.8 (5.5)	11.3 (3.1)	12.3 (3.4)
Average Temperature (°C)	21.0	20.6	22.3	22.2	20.5	21.5	23.5	21.4
Minimum Temperature (°C)	16.1	15.6	16.4	17.9	18.6	19.4	18.8	15.8
Maximum Temperature (°C)	27.6	26.2	29.1	23.1	23.1	24.8	30.3	28.6
Precipitation (mm)	0	0	0	0	0.6	0	0	0
Relative Humidity (%)	58.2	66.7	63.3	80.5	97.2	95.1	72.6	74.3

3.0 AIR QUALITY MONITORING PROGRAM RESULTS

3.1 TSP AND METALS RESULTS

The following section provides a summary of TSP and metals (arsenic and mercury) results for the program. Appendix C provides laboratory certificates for all analyses (COAs).

A review of Nova Scotia standards and guidelines indicates the province provides an ambient air quality objective for TSP, and there are currently no objectives available for metals. However, the Ontario Ministry of Environment (MOE) does provide ambient air quality criteria (AAQC) for metals, including arsenic and mercury (OMOE, 2012). Table 3-1 outlines the applicable criteria for comparison with the TSP and metals results.

The AGAT Laboratories COAs provide the results for TSP in mg and the results for mercury and arsenic in µg/filter. To compare these concentrations with the Nova Scotia standards and guidelines and the MOE AAQC, the units were converted to µg/m³. The TSP concentrations were converted from mg to µg/m³ using the following equation:

$$TSP = \left(\frac{\text{Concentration (mg)}}{\text{Flow Rate of the Hi-Volume Sampler}} \right) * 1000$$

The mercury and arsenic concentrations were converted from µg/filter to µg/m³ using the following equation:

$$\text{Metals} = \left(\frac{\text{Concentration (µg/filter)}}{\text{Flow Rate of the Hi-Volume Sampler}} \right)$$

Table 3-1: Applicable Site Criteria

Parameter	Guidelines	24 Hour Objective (µg/m ³)	24 Hour Criteria (µg/m ³)	Limiting Effect
Total suspended particulate (TSP)	<i>Nova Scotia Ambient Air Quality Objective</i>	120	-	Visibility ⁽¹⁾
Mercury	<i>Summary of Standards and Guidelines to Support Ontario Regulation 419/05</i>	-	2	Health
Arsenic	<i>– Air Pollution – Local Air Quality (April 2012)</i>	-	0.3	Health

Note: (1) Ontario MOE provides the same criterion for TSP as the Nova Scotia objective. The limiting effect provided by Ontario MOE is visibility.

Table 3-2 provides a summary of TSP and metals results for the program. Comments providing information on possible sources of dust are included for samples that exceeded criteria.

Table 3-2: Summary of TSP and Metals Results

Location	Sample ID #	Date	TSP (µg/m ³)	Arsenic (µg/m ³)	Mercury ⁽¹⁾ (µg/m ³)	Comments
TSP 1	070820-1-01	07-Aug-20	76.0	0.032	<0.000003	Located along the western property boundary.
	080820-1-07	08-Aug-20	77.4	0.010	<0.000003	
	090820-1-13	09-Aug-20	43.6	0.009	<0.000002	
	100820-1-19	10-Aug-20	82.9	0.018	<0.000002	
	110820-1-25	11-Aug-20	23.9	0.005	<0.000002	
	120820-1-31	12-Aug-20	22.8	0.003	<0.000002	
	130820-1-37	13-Aug-20	83.3	0.011	<0.000002	
TSP 2	070820-2-02	07-Aug-20	82.9	0.017	<0.000003	Located west of the Open Pit.
	080820-2-08	08-Aug-20	110.3	0.026	<0.000003	
	090820-2-14	09-Aug-20	81.6	0.020	<0.000003	
	100820-2-20	10-Aug-20	163.6	0.049	<0.000003	
	110820-2-26	11-Aug-20	28.4	0.005	<0.000003	
	120820-2-32	12-Aug-20	32.4	0.007	<0.000003	
	130820-2-38	13-Aug-20	107.0	0.033	<0.000003	
TSP 3	070820-3-03	07-Aug-20	30.8	0.006	<0.000003	TSP 3 is located in the center of the Touquoy operations, 40 m from the Haul Road crossing at Mooseland Road. Visible dust was often observed when the haul trucks were driving along both roads and likely impacted the TSP samples at this location. Public traffic was also observed from this location.
	080820-3-09	08-Aug-20	140.9	0.016	<0.000003	
	090820-3-15	09-Aug-20	121.6	0.018	<0.000003	
	100820-3-21	10-Aug-20	133.4	0.033	<0.000002	
	110820-3-27	11-Aug-20	94.5	0.043	<0.000002	
	120820-3-33	12-Aug-20	103.2	0.013	<0.000002	
	130820-3-39	13-Aug-20	73.6	0.008	<0.000002	

Location	Sample ID #	Date	TSP (µg/m ³)	Arsenic (µg/m ³)	Mercury ⁽¹⁾ (µg/m ³)	Comments
TSP 4	070820-4-04	07-Aug-20	25.7	0.002	<0.000003	Background location located along Moose River Rd. at a distance of 1.95 km from the open pit. NSTIR recently paved along Moose River Road. As a result of the road being paved, visible dust was greatly reduced during the 2020 sampling program when compared to the 2019 program (when the road was unpaved).
	080820-4-10	08-Aug-20	28.1	0.002	<0.000003	
	090820-4-16	09-Aug-20	18.0	0.002	<0.000003	
	100820-4-22	10-Aug-20	14.0	0.003	<0.000003	
	110820-4-28	11-Aug-20	10.8	0.001	<0.000003	
	120820-4-34	12-Aug-20	8.5	0.001	<0.000003	
	130820-4-40	13-Aug-20	21.9	0.002	<0.000003	
TSP 5	070820-5-05	07-Aug-20	87.5	0.005	<0.000003	Located along the eastern property boundary.
	080820-5-11	08-Aug-20	28.7	0.003	<0.000003	
	090820-5-17	09-Aug-20	62.8	0.006	<0.000002	
	100820-5-22	10-Aug-20	77.9	0.008	<0.000003	
	130820-5-34	13-Aug-20	62.6	0.008	<0.000003	
	140820-4-43	14-Aug-20	96.8	0.007	<0.000003	
TSP 6	260719-6-06	07-Aug-20	53.2	0.006	<0.000003	Southeast of the TMF.
	270719-6-12	08-Aug-20	30.4	0.006	<0.000003	
	280719-6-18	09-Aug-20	30.6	0.009	<0.000003	
	290719-6-24	10-Aug-20	23.8	0.012	<0.000003	
	300719-6-30	11-Aug-20	9.2	0.001	<0.000003	
	310719-6-36	12-Aug-20	10.8	0.002	<0.000003	
	010819-6-42	13-Aug-20	31.1	0.005	<0.000003	

Note: (1) Mercury results only include the particulate fraction for mercury.

A comparison of the TSP results with the Nova Scotia Ambient Air Quality Objective (Table 3-1) indicates there were three exceedances to the 24-Hour objective at Location 3 (Haul Road/Haul Road crossing, center of Touquoy operations) on August 8th, 9th and 10th and one exceedance at

Location 2 (west of the Open Pit) on August 10th. These exceedances are highlighted in bold in Table 3-2. There were no other exceedances of the TSP 24-hour objective at any of the other remaining locations. A review of the arsenic results determined there are no exceedances to the 24-hour criterion. Mercury was not detected in any of the samples for all locations for the 2020 AAMP.

Table 3-3 provides a summary of TSP and arsenic averages for the program.

Table 3-3: TSP and Arsenic Program Averages

Parameter	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6
TSP	58.6	86.6	99.7	18.1	65.8	27.0
Arsenic	0.013	0.023	0.019	0.0020	0.0063	0.0057

The seven-day program averages for TSP ranged from a low of 18.1 µg/m³ at the background Location 4 to a high of 99.7 µg/m³ at Location 3 (Haul Road Location). The background location average results (18.1 µg/m³) were approximately five times lower than the highest average results (99.7 µg/m³) identified at Location 3, which is located onsite, in close proximity to the Haul Road.

The background location (Location 4) is representative of concentrations in the airshed that are not influenced by site activities. The average TSP results (18.1 µg/m³) for 2020 were lower and comparable to the average results of 40 µg/m³ in 2017 and 27 µg/m³ in 2018. In contrast, the background location (Location 4) during the 2019 sampling monitoring program had an average of 610 µg/m³. The 2019 levels identified at the background Location 4 suggest that non-site related sources caused the TSP exceedances. Prior to the 2019 sampling program, Nova Scotia Transportation and Infrastructure Renewal (NSTIR) removed the pavement from Moose River Road (as well as the Mooseland Road) and replaced it with gravel. Based on this change to the road, along with observations collected during the 2019 air monitoring program, the exceedances and persistently high concentrations for 2019 at Location 4 were a result of dust emissions generated from the use of the unpaved Moose River Road. According to personnel from Atlantic Gold, the Moose River Road (as well as the Mooseland Road) were resurfaced with asphalt in the fall of 2019. This change in road surface conditions appears to have resulted in a significant reduction in TSP concentrations for 2020 for the background location (Location 4). Other program sampling locations (Locations 1, 3 and 5) also had lower average concentrations in 2020 when compared to the 2019 AAMP averages, suggesting the unpaved Moose River Road may also have influenced results in 2019 at these locations.

Locations 2, 3 and 6 are located near working areas of the site. For Location 3, which had the highest TSP results, dust from the haul truck crossing at Mooseland Road and from the haul trucks driving over the Haul Road appear to have contributed to the particulate loading of the samples. Locations 2 and 6 produced an average TSP of $86.6 \mu\text{g}/\text{m}^3$ and $27.0 \mu\text{g}/\text{m}^3$, respectively. The result for one day (August 10th) did not meet regulatory compliance at Location 2 and the results for three events (August 8th, 9th, and 10th) did not meet regulatory compliance at Location 3. All other results were in compliance for the remaining monitoring days for these locations.

Locations 1 and 5 are located at the west and east boundaries of the Touquoy Mine property, respectively. Both locations were in compliance with the Nova Scotia 24-hour TSP objective.

A review of the average arsenic concentrations determined the average concentrations follow a similar trend to the TSP concentrations with the highest concentrations at Locations 2 ($0.023 \mu\text{g}/\text{m}^3$) and 3 ($0.020 \mu\text{g}/\text{m}^3$), the two locations closest to mining operations. All of the remaining concentrations for the samplers are at least 40% lower than the concentrations identified at the Location 2.

3.2 QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC)

Field QA/QC Program

To minimize cross-contamination during sampling, a field QA/QC program was followed which included the following measures:

- Disposable nitrile gloves were used to install the TSP filter, as well as collect the TSP filter sample, and discarded following collection;
- Laboratory supplied envelopes were used to store the TSP filter samples; and
- Samples were stored in envelopes and transported to the laboratory with the appropriate Chain of Custody documentation for tracking purposes.

Field and Trip Blanks (QC)

Two blank TSP samples were submitted to the laboratory for analysis as part of the program QA/QC. Table 3-4 outlines the field blanks collected.

The results of this program are supported by QA/QC measures and can be relied upon for the purposes of this program.

Table 3-4: Summary of TSP and Metals QA/QC

Location	Date	Parameter	Field/Trip Blank (µg/filter)
TSP 2 Field Blank	12-Aug-20	TSP	18
		Arsenic	0.15
		Mercury	<0.01
Trip Blank	08-Aug-20	TSP	<10
		Arsenic	0.22
		Mercury	<0.01

Concentrations of arsenic and TSP were detected in the field blank on Aug 12th. A review of the results determined there were no exceedances of the 24-hour criteria for TSP or arsenic on August 12th and, as a result, any adjustment using the field blank values will not affect the overall outcome of the program with respect to compliance. Arsenic was also detected in the QA Trip Blank for the program. Since arsenic was detected in the trip blank, all the arsenic results for the program were blank corrected. Mercury was detected at the method detection limit for mercury. Mercury was not detected in any of the samples during the entire program and as a result, none of the sample results were blank corrected for mercury.

4.0 DISCUSSION AND RECOMMENDATIONS

A review of the program results determined there were three exceedances to the 24-hour TSP objective at Location 3 which is adjacent to the Haul Road and Haul Road crossing on Mooseland Road, and one exceedance at Location 2, which is situated near the Open Pit. Based on a review of the data and observations performed during the program, it is likely the exceedances at these two locations were a result of dust being generated from localized sources, such as traffic on the haul road, haul road crossing and in the open pit area.

All the arsenic and mercury results were also in compliance with their respective applicable site criteria.

Based on the results of this ambient air monitoring program, the following is recommended:

- In order prevent exceedances from occurring in the future, Atlantic Mining NS Inc. should continue to use standard industry dust management practices on the Haul Road in order to minimize dust generation from haul trucks driving over the unpaved Haul Road;

- Previous air monitoring reports for the site have indicated the use of High-Volume equipment is not practical for the remote areas of the site. At locations where power is not readily accessible or long trend data would be useful, consideration should be given to supplementing the High-Volume sampling program by installing passive samplers such as dust buckets in these remote areas.
- In subsequent programs, a field blank will be collected for every day of monitoring and if the blanks show consistent results, the rule of using 10% (or 4 blanks) of the total number of samples for the program will be implemented after the 2021 program.

5.0 REFERENCES

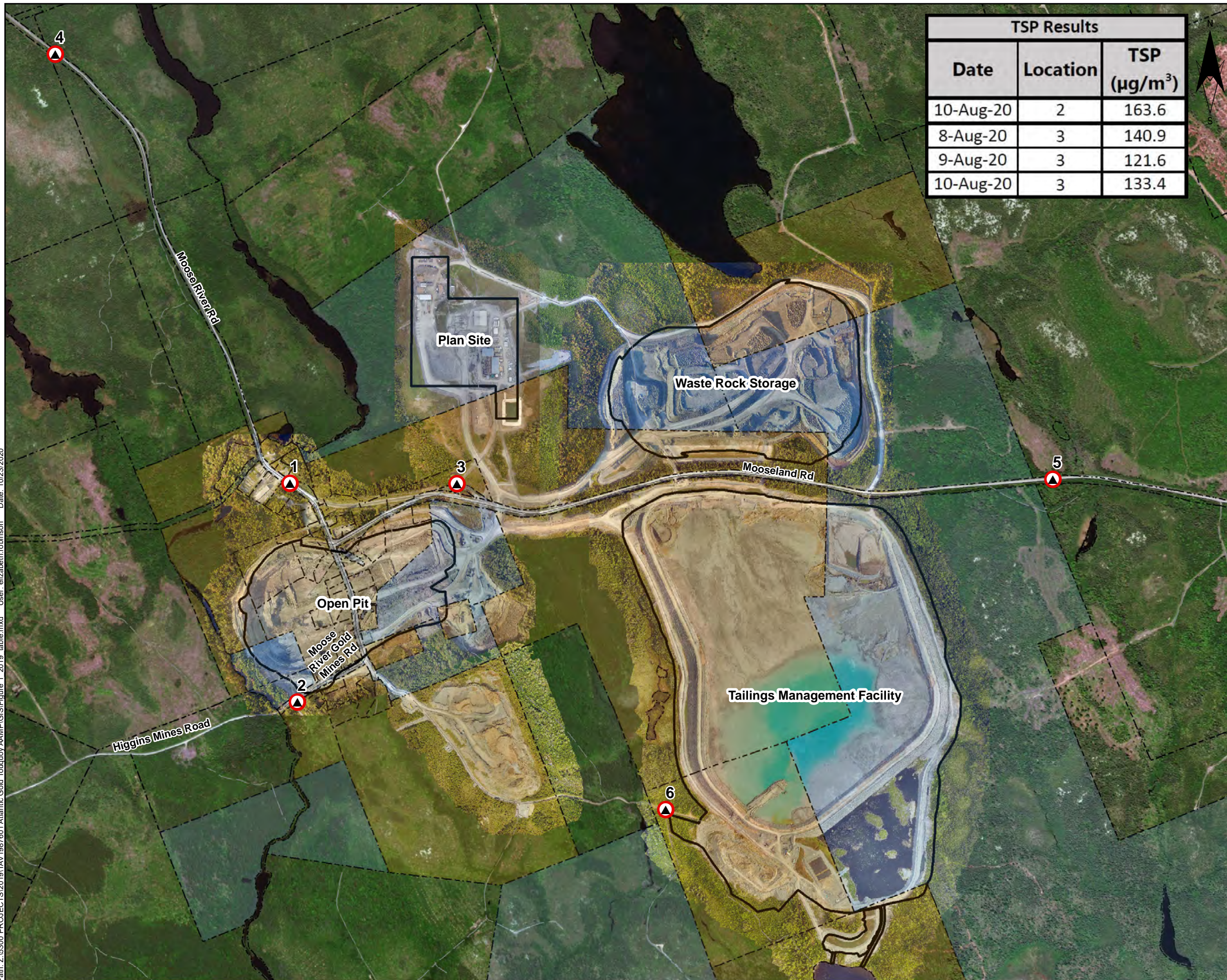
Nova Scotia Environment. Air Quality Regulations made under Sections 25 and 112 of the Environment Act. Reg. 179/2014.

Ontario Ministry of Environment. Ontario's Ambient Air Quality Criteria. April, 2012.

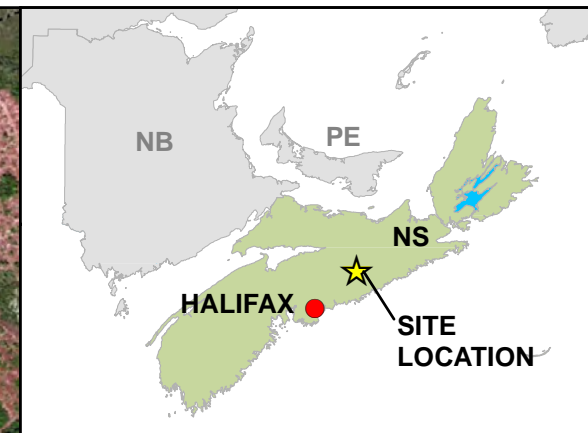
Appendix A

Site Map

Path: Z:\5300 PROJECTS\2019\TAV\987601 Atlantic Gold Touquoy AAMP\GIS\Figure 1 - 2019 Table.mxd User: alizabeth.robinson Date: 10/23/2020



TSP Results		
Date	Location	TSP ($\mu\text{g}/\text{m}^3$)
10-Aug-20	2	163.6
8-Aug-20	3	140.9
9-Aug-20	3	121.6
10-Aug-20	3	133.4



Legend

- TSP Locations
- Atlantic Mining NS Corp
- DLF Land
- Driveways / Trails
- Roads
- Property Boundaries
- Facility Footprint

The map shown here has been created with all due and reasonable care and is strictly for use with Wood Project Number: TE201029. This map has not been certified by a licensed land surveyor, and any third party use of this map comes without warranties of any kind. Wood assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.

CLIENT:
Atlantic Mining NS
6749 Moose River Road, RR#2
Middle Musquodoboit, NS B0N 1X0



PROJECT:
Air Quality Monitoring
Touquoy Gold Mine
Halifax County, Nova Scotia

TITLE:
Air Quality Monitoring Locations
Aug 7 - Aug 14, 2020

DATUM: NAD 83	DWN BY: ER	DATE: OCT 2020
PROJECTION: UTM ZONE 20 NORTH	CHK'D BY: KG	SCALE: 1:12,500
PROJECT NO: TE201029	REV NO:	FIGURE NO: 1

Appendix B

2020 Site Photos



Photo 1: TSP 1 located at 6719 Moose River Rd.



Photo 2: TSP 2 located on Higgins Mines Rd.



Photo 3: TSP 3 located near the crossing of the Haul road with Mooseland Road.



Photo 4: TSP 4 located near the shoulder of Mooseland Road.



Photo 5: TSP 5 located near the shoulder of Mooseland Road.



Photo 6: TSP 6 located near the TMF.

Appendix C

Laboratory Certifications (AGAT)

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, a div. of
Wood Canada Ltd.
50 TROOP AVENUE, UNIT 300
DARTMOUTH, NS B3B1Z1
(902) 468-2848

ATTENTION TO: Kim Green

PROJECT: TE201029

AGAT WORK ORDER: 20X639321

AIR QUALITY MONITORING REVIEWED BY: Marta Manka, Data Reporter

OCCUPATIONAL HYGIENE REVIEWED BY: Marta Manka, Data Reporter

DATE REPORTED: Sep 04, 2020

PAGES (INCLUDING COVER): 16

VERSION*: 2

Should you require any information regarding this analysis please contact your client services representative at (902) 468-8718

*Notes

VERSION 2: This report supersedes all previous reports and has been updated to include the Hg data. This report also includes revised TSP results for the FB sample.

Disclaimer:

- *All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.*
- *All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.*
- *AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.*
- *This Certificate shall not be reproduced except in full, without the written approval of the laboratory.*
- *The test results reported herewith relate only to the samples as received by the laboratory.*
- *Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.*
- *All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.*



Air Quality Summary

AGAT WORK ORDER: 20X639321

PROJECT: TE201029

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
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FAX (902)468-8924
<http://www.agatlabs.com>

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, a div. of Wood Canada Ltd.

ATTENTION TO: Kim Green

SAMPLING SITE:

SAMPLED BY:

Parameter	Unit	Number of Samples	Peak Reading	Network Average
Total Suspended Particulate	mg	43	282	107
Arsenic	µg/filter	43	93.30	20.10



Certificate of Analysis

AGAT WORK ORDER: 20X639321

PROJECT: TE201029

11 Morris Drive, Unit 122
 Dartmouth, Nova Scotia
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 FAX (902)468-8924
<http://www.agatlabs.com>

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, a div. of Wood Canada Ltd. ATTENTION TO: Kim Green

SAMPLING SITE:

SAMPLED BY:

Metals on Filter Paper (ug/filter) - Arsenic

DATE RECEIVED: 2020-08-18

DATE REPORTED: 2020-09-04

Parameter	Unit	G / S	RDL	1364806	1364816	1364817	1364818	1364819	1364820	1364821	1364822
SAMPLE DESCRIPTION:		070820-1-01	070820-2-02	070820-3-03	070820-4-04	070820-5-05	070820-6-06	080820-1-07	080820-2-08		
SAMPLE TYPE:		Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample		
DATE SAMPLED:		2020-08-07	2020-08-07	2020-08-07	2020-08-07	2020-08-07	2020-08-07	2020-08-07	2020-08-07	2020-08-08	2020-08-08
Arsenic	µg/filter	0.05	19.8	27.7	12.3	2.44	9.78	11.1	19.9	47.9	
SAMPLE DESCRIPTION:		080820-3-09	080820-4-10	080820-5-11	080820-6-12	090820-1-13	090820-2-14	090820-3-15	090820-4-16		
SAMPLE TYPE:		Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample		
DATE SAMPLED:		2020-08-08	2020-08-08	2020-08-08	2020-08-08	2020-08-09	2020-08-09	2020-08-09	2020-08-09	2020-08-09	2020-08-09
Arsenic	µg/filter	0.05	29.2	4.34	6.15	10.2	20.1	38.2	34.3	4.14	
SAMPLE DESCRIPTION:		090820-5-17	090820-6-18	100820-1-19	100820-2-20	100820-3-21	100820-4-22	100820-5-23	100820-6-24		
SAMPLE TYPE:		Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample		
DATE SAMPLED:		2020-08-09	2020-08-09	2020-08-10	2020-08-10	2020-08-10	2020-08-10	2020-08-10	2020-08-10	2020-08-10	2020-08-10
Arsenic	µg/filter	0.05	11.6	16.6	39.8	83.2	69.1	4.59	16.6	21.2	
SAMPLE DESCRIPTION:		110820-1-25	110820-2-26	110820-3-27	110820-4-28	110820-5-29	110820-6-30	120820-1-31	120820-2-32		
SAMPLE TYPE:		Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample		
DATE SAMPLED:		2020-08-11	2020-08-11	2020-08-11	2020-08-11	2020-08-11	2020-08-11	2020-08-11	2020-08-11	2020-08-12	2020-08-12
Arsenic	µg/filter	0.05	11.7	9.39	93.3	2.43	5.23	2.43	7.82	11.6	
SAMPLE DESCRIPTION:		120820-3-33	120820-4-34	120820-6-36	130820-1-37	130820-2-38	130820-3-39	130820-4-40	130820-6-42		
SAMPLE TYPE:		Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample		
DATE SAMPLED:		2020-08-12	2020-08-12	2020-08-12	2020-08-13	2020-08-13	2020-08-13	2020-08-13	2020-08-13	2020-08-13	2020-08-13
Arsenic	µg/filter	0.05	27.6	2.14	3.02	24.9	58.1	17.4	3.89	9.54	

Certified By:

Marla Manka



Certificate of Analysis

AGAT WORK ORDER: 20X639321

PROJECT: TE201029

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Dartmouth, Nova Scotia
CANADA B3B 1M2
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CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, a div. of Wood Canada Ltd. ATTENTION TO: Kim Green

SAMPLING SITE:

SAMPLED BY:

Metals on Filter Paper (ug/filter) - Arsenic

DATE RECEIVED: 2020-08-18

DATE REPORTED: 2020-09-04

Parameter	Unit	SAMPLE DESCRIPTION:		
		G / S	RDL	
		140820-5-43	080820-TB	120820-FB
		Filter Sample	Filter Sample	Filter Sample
		2020-08-14	2020-08-08	2020-08-12
		1364861	1364862	1364863
Arsenic	µg/filter	0.05	13.1	0.22
				0.15

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:



Certificate of Analysis

AGAT WORK ORDER: 20X639321

PROJECT: TE201029

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<http://www.agatlabs.com>

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, a div. of Wood Canada Ltd.

ATTENTION TO: Kim Green

SAMPLING SITE:

SAMPLED BY:

Particulate on Filter Paper (TSP)

DATE RECEIVED: 2020-08-18

DATE REPORTED: 2020-09-04

Parameter	Unit	G / S	RDL	1364806	1364816	1364817	1364818	1364819	1364820	1364821	1364822
SAMPLE DESCRIPTION:		070820-1-01	070820-2-02	070820-3-03	070820-4-04	070820-5-05	070820-6-06	080820-1-07	080820-2-08		
SAMPLE TYPE:		Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample		
DATE SAMPLED:		2020-08-07	2020-08-07	2020-08-07	2020-08-07	2020-08-07	2020-08-07	2020-08-07	2020-08-07	2020-08-08	2020-08-08
Total Suspended Particulate	mg	10	144	132	60	38	174	96	146	199	
SAMPLE DESCRIPTION:		080820-3-09	080820-4-10	080820-5-11	080820-6-12	090820-1-13	090820-2-14	090820-3-15	090820-4-16		
SAMPLE TYPE:		Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample		
DATE SAMPLED:		2020-08-08	2020-08-08	2020-08-08	2020-08-08	2020-08-09	2020-08-09	2020-08-09	2020-08-09	2020-08-09	2020-08-09
Total Suspended Particulate	mg	10	260	47	55	55	96	152	236	30	
SAMPLE DESCRIPTION:		090820-5-17	090820-6-18	100820-1-19	100820-2-20	100820-3-21	100820-4-22	100820-5-23	100820-6-24		
SAMPLE TYPE:		Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample		
DATE SAMPLED:		2020-08-09	2020-08-09	2020-08-10	2020-08-10	2020-08-10	2020-08-10	2020-08-10	2020-08-10	2020-08-10	2020-08-10
Total Suspended Particulate	mg	10	126	57	180	277	282	23	152	43	
SAMPLE DESCRIPTION:		110820-1-25	110820-2-26	110820-3-27	110820-4-28	110820-5-29	110820-6-30	120820-1-31	120820-2-32		
SAMPLE TYPE:		Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample		
DATE SAMPLED:		2020-08-11	2020-08-11	2020-08-11	2020-08-11	2020-08-11	2020-08-11	2020-08-11	2020-08-11	2020-08-12	2020-08-12
Total Suspended Particulate	mg	10	53	50	203	18	12	17	50	56	
SAMPLE DESCRIPTION:		120820-3-33	120820-4-34	120820-6-36	130820-1-37	130820-2-38	130820-3-39	130820-4-40	130820-6-42		
SAMPLE TYPE:		Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample		
DATE SAMPLED:		2020-08-12	2020-08-12	2020-08-12	2020-08-13	2020-08-13	2020-08-13	2020-08-13	2020-08-13	2020-08-13	2020-08-13
Total Suspended Particulate	mg	10	218	14	20	183	190	159	36	57	

Certified By:

Marla Manka



Certificate of Analysis

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CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, a div. of Wood Canada Ltd.

ATTENTION TO: Kim Green

SAMPLING SITE:

SAMPLED BY:

Particulate on Filter Paper (TSP)

DATE RECEIVED: 2020-08-18

DATE REPORTED: 2020-09-04

Parameter	Unit	SAMPLE DESCRIPTION:		140820-5-43	080820-TB	120820-FB
		G / S	RDL	Filter Sample	Filter Sample	Filter Sample
		DATE SAMPLED:		2020-08-14	2020-08-08	2020-08-12
Total Suspended Particulate	mg	10	191	<10	12	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:

Marla Manka



Certificate of Analysis

AGAT WORK ORDER: 20X639321

PROJECT: TE201029

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CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, a div. of Wood Canada Ltd.

ATTENTION TO: Kim Green

SAMPLING SITE:

SAMPLED BY:

Mercury (air) (µg)											
DATE RECEIVED: 2020-08-18						DATE REPORTED: 2020-09-04					
		SAMPLE DESCRIPTION:		070820-1-01	070820-2-02	070820-3-03	070820-4-04	070820-5-05	070820-6-06	080820-1-07	080820-2-08
		SAMPLE TYPE:		Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample
		DATE SAMPLED:		2020-08-07	2020-08-07	2020-08-07	2020-08-07	2020-08-07	2020-08-07	2020-08-08	2020-08-08
Parameter	Unit	G / S	RDL	1364806	1364816	1364817	1364818	1364819	1364820	1364821	1364822
Mercury	µg			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
		SAMPLE DESCRIPTION:		080820-3-09	080820-4-10	080820-5-11	080820-6-12	090820-1-13	090820-2-14	090820-3-15	090820-4-16
		SAMPLE TYPE:		Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample
		DATE SAMPLED:		2020-08-08	2020-08-08	2020-08-08	2020-08-08	2020-08-09	2020-08-09	2020-08-09	2020-08-09
Parameter	Unit	G / S	RDL	1364823	1364824	1364825	1364826	1364827	1364828	1364829	1364830
Mercury	µg			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
		SAMPLE DESCRIPTION:		090820-5-17	090820-6-18	100820-1-19	100820-2-20	100820-3-21	100820-4-22	100820-5-23	100820-6-24
		SAMPLE TYPE:		Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample
		DATE SAMPLED:		2020-08-09	2020-08-09	2020-08-10	2020-08-10	2020-08-10	2020-08-10	2020-08-10	2020-08-10
Parameter	Unit	G / S	RDL	1364831	1364832	1364833	1364834	1364835	1364836	1364837	1364838
Mercury	µg			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
		SAMPLE DESCRIPTION:		110820-1-25	110820-2-26	110820-3-27	110820-4-28	110820-5-29	110820-6-30	120820-1-31	120820-2-32
		SAMPLE TYPE:		Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample
		DATE SAMPLED:		2020-08-11	2020-08-11	2020-08-11	2020-08-11	2020-08-11	2020-08-11	2020-08-12	2020-08-12
Parameter	Unit	G / S	RDL	1364839	1364840	1364841	1364842	1364843	1364844	1364845	1364846
Mercury	µg			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
		SAMPLE DESCRIPTION:		120820-3-33	120820-4-34	120820-6-36	130820-1-37	130820-2-38	130820-3-39	130820-4-40	130820-6-42
		SAMPLE TYPE:		Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample	Filter Sample
		DATE SAMPLED:		2020-08-12	2020-08-12	2020-08-12	2020-08-13	2020-08-13	2020-08-13	2020-08-13	2020-08-13
Parameter	Unit	G / S	RDL	1364847	1364854	1364855	1364856	1364857	1364858	1364859	1364860
Mercury	µg			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Certified By:

Marla Manka



Certificate of Analysis

AGAT WORK ORDER: 20X639321

PROJECT: TE201029

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CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, a div. of Wood Canada Ltd.

ATTENTION TO: Kim Green

SAMPLING SITE:

SAMPLED BY:

Mercury (air) (µg)

DATE RECEIVED: 2020-08-18

DATE REPORTED: 2020-09-04

Parameter	Unit	SAMPLE DESCRIPTION:				
		140820-5-43		080820-TB		120820-FB
		Filter Sample		Filter Sample		Filter Sample
		DATE SAMPLED: 2020-08-14		2020-08-08		2020-08-12
G / S	RDL	1364861	1364862	1364863		
Mercury	µg	0.01	<0.01	<0.01	<0.01	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

1364806-1364863 Elevated RDLs indicate the degree of sample dilutions prior to the analysis to keep analytes within the calibration range or reduce matrix interference.

Analysis performed at AGAT Montreal (unless marked by *)

Certified By:

Quality Assurance

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, a div. of AGAT WORK ORDER: 20X639321
 PROJECT: TE201029 ATTENTION TO: Kim Green
 SAMPLING SITE: SAMPLED BY:

Air Quality Monitoring															
RPT Date: Sep 04, 2020			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE	
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Metals on Filter Paper (ug/filter) - Arsenic															
Arsenic	1364834	1364834	83.2	77.7	6.8%	< 0.05	103%	80%	120%	102%	80%	120%	80%	70%	130%
Metals on Filter Paper (ug/filter) - Arsenic															
Arsenic	1364860	1364860	9.54	6.88	32.4%	< 0.05	98%	80%	120%	98%	80%	120%	80%	70%	130%
Metals on Filter Paper (ug/filter) - Arsenic															
Arsenic	1353498	1353498	0.64	0.91	34.8%	< 0.05	100%	80%	120%	98%	80%	120%	73%	70%	130%

Certified By: Marla Manka

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.

Results relate only to the items tested. Results apply to samples as received.

Quality Assurance

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, a div. of AGAT WORK ORDER: 20X639321
 PROJECT: TE201029 ATTENTION TO: Kim Green
 SAMPLING SITE: SAMPLED BY:

Occupational Hygiene Analysis

RPT Date: Sep 04, 2020			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper		Lower	Upper		Lower	Upper	
Mercury (air) (µg)																
Mercury	1368806	NA	NA	NA	0.0%	< 0.01	NA	80%	120%	95%	80%	120%	NA	80%	120%	

Comments: NA : Non applicable

If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

The percentage of recovery of the RM may be outside of the acceptability criteria of 80-120%, if conform to the criteria provided on the Certificate of Analysis of the reference material.

NA in the spike blank or RM indicates that it is not required by the procedure.

Certified By: Marla Manka

Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, a div. of AGAT WORK ORDER: 20X639321
 PROJECT: TE201029 ATTENTION TO: Kim Green
 SAMPLING SITE: SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Air Quality Monitoring			
Arsenic	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Total Suspended Particulate	INOR-121-6041	Modified EPA Method 5	GRAVIMETRIC
Occupational Hygiene Analysis			
Mercury	MET-101-6102F, not accredited by MDDELCC	MA. 200 Hg 1.1; NIOSH 6009	CV/AA



Unit 122 - 11 Morris Dr.
Dartmouth, Nova Scotia
B3B 1M2
http://webearth.agatlabs.com

Phone: 902-468-8718
Fax: 902-468-8924
www.agatlabs.com

Laboratory use Only
 Arrival Condition: Good Poor (complete 'notes')
 Arrival Temperature: 24.8, 22.8, 20.9 AGAT Job Number: 20X639321
 Notes: 43 total

Drinking Water Sample (y/n): _____ Reg. No. _____
 Waterworks Number: _____

Report To: Company: Wood E & IS Contact: Kim Green Address: 50 Troop Avenue Phone: 902-468-2848 FAX: 902-468-1314 PO#: _____ AGAT Quotation: _____ Client Project #: <u>TE201029</u>		Report Information 1. Name: Kim Green Email: kimberlea.green@woodpic.com 2. Name: Elizabeth Robinson Email: elizabeth.robinson@woodpic.com		Report Format <input type="checkbox"/> Single PDF sample per page <input checked="" type="checkbox"/> Multiple PDF samples per page <input checked="" type="checkbox"/> Excel Format Included		Turnaround Time (TAT) Business Days Regular TAT: <input checked="" type="checkbox"/> 5 - 7 days Rush TAT: <input type="checkbox"/> 1 day <input type="checkbox"/> 2 days <input type="checkbox"/> 3 - 4 days Date Required: _____ Time Required: <u>20AG018 5:31 PM</u>	
Invoice to: Same (Y/N) - Circle Company: SAME Contact: Denise Hirtle Address: _____ Phone: _____ Fax: _____ PO#/Credit Card #: _____		Regulatory Requirements (Check): <input type="checkbox"/> List Guidelines on Report <input type="checkbox"/> Do Not List Guidelines on Report <input type="checkbox"/> PIRI Site Info (check all that apply): <input type="checkbox"/> Teir 1 <input type="checkbox"/> Res <input type="checkbox"/> Pot <input type="checkbox"/> Coarse <input type="checkbox"/> Teir 2 <input type="checkbox"/> Com <input type="checkbox"/> N/Pot <input type="checkbox"/> Fine <input type="checkbox"/> Gas <input type="checkbox"/> Fuel <input type="checkbox"/> Lube <input type="checkbox"/> CCME <input type="checkbox"/> CDWQ <input type="checkbox"/> Ind <input type="checkbox"/> NSDFOSP <input type="checkbox"/> Com <input type="checkbox"/> HRM 101 <input type="checkbox"/> Res/P Storm Water <input type="checkbox"/> Ag <input type="checkbox"/> HRM 101 <input type="checkbox"/> FWAL Waste Water <input type="checkbox"/> Sediment <input type="checkbox"/> Other _____					

SAMPLE IDENTIFICATION	DATE / TIME SAMPLED	SAMPLE MATRIX	# OF CONTAINERS	COMMENTS - Site/Sample Info, Sample Containment	TSP	Mercury	Arsenic														Lab Sample #
070820-1-01	7-Aug-20	Filter	1 filter		X	X	X														
070820-2-02	7-Aug-20	Filter	1 filter		X	X	X														
070820-3-03	7-Aug-20	Filter	1 filter		X	X	X														
070820-4-04	7-Aug-20	Filter	1 filter		X	X	X														
070820-5-05	7-Aug-20	Filter	1 filter		X	X	X														
070820-6-06	7-Aug-20	Filter	1 filter		X	X	X														
080820-1-07	8-Aug-20	Filter	1 filter		X	X	X														
080820-2-08	8-Aug-20	Filter	1 filter		X	X	X														
080820-3-09	8-Aug-20	Filter	1 filter		X	X	X														

Sample Relinquished By (print name & sign) Elizabeth Robinson	Date/Time 18-Aug-20	Samples Received By (print name and sign) <i>[Signature]</i>	Date/Time Aug 18	Special Instructions
Sample Relinquished By (print name & sign) <i>[Signature]</i>	Date/Time 17:30	Samples Received By (print name and sign) <i>[Signature]</i>	Date/Time	

[Handwritten signature]

[Handwritten signature]



Unit 122 - 11 Morris Dr.
Dartmouth, Nova Scotia
B3B 1M2
http://webearth.agatlabs.com

Phone: 902-468-8718
Fax: 902-468-8924
www.agatlabs.com

Laboratory use Only

Arrival Condition: Good Poor (complete 'notes')

Arrival Temperature: _____ AGAT Job Number: _____

Notes: _____

Drinking Water Sample (y/n): _____ Reg. No. _____

Waterworks Number: _____

Report To: Company: Wood E & IS Contact: Kim Green Address: 50 Troop Avenue Phone: 902-468-2848 FAX: 902-468-1314 PO#: _____ AGAT Quotation: _____ Client Project #: TE201029		Report Information 1. Name: Kim Green Email: kimberlea.green@woodplc.com 2. Name: Elizabeth Robinson Email: elizabeth.robinson@woodplc.com		Report Format <input type="checkbox"/> Single PDF sample per page <input checked="" type="checkbox"/> Multiple PDF samples per page <input checked="" type="checkbox"/> Excel Format Included		Turnaround Time (TAT) Business Days Regular TAT: <input checked="" type="checkbox"/> 5 - 7 days Rush TAT: <input type="checkbox"/> 1 day <input type="checkbox"/> 2 days <input type="checkbox"/> 3 - 4 days Date Required: _____ Time Required: _____	
Invoice to: Same (Y/N) - Circle Company: SAME Contact: Denise Hirtle Address: _____ Phone: _____ Fax: _____ PO#/Credit Card #: _____		Regulatory Requirements (Check): <input type="checkbox"/> List Guidelines on Report <input type="checkbox"/> Do Not List Guidelines on Report <input type="checkbox"/> PIRI Site Info (check all that apply): <input type="checkbox"/> Teir 1 <input type="checkbox"/> Res. <input type="checkbox"/> Pot. <input type="checkbox"/> Coarse <input type="checkbox"/> Teir 2 <input type="checkbox"/> Com <input type="checkbox"/> N/Pot. <input type="checkbox"/> Fine <input type="checkbox"/> Gas <input type="checkbox"/> Fuel <input type="checkbox"/> Lube <input type="checkbox"/> CCME <input type="checkbox"/> CDWQ <input type="checkbox"/> Ind <input type="checkbox"/> NSDFOSP <input type="checkbox"/> Com <input type="checkbox"/> HRM 101 <input type="checkbox"/> Res/P <input type="checkbox"/> Storm Water <input type="checkbox"/> Ag <input type="checkbox"/> HRM 101 <input type="checkbox"/> FWAL <input type="checkbox"/> Waste Water <input type="checkbox"/> Sediment <input type="checkbox"/> Other _____					

SAMPLE IDENTIFICATION	DATE / TIME SAMPLED	SAMPLE MATRIX	# OF CONTAINERS	COMMENTS - Site/Sample Info, Sample Containment	TSP	Mercury	Arsenic											Lab Sample #				
080820-4-10	8-Aug-20	Filter	1 filter		X	X	X															
080820-5-11	8-Aug-20	Filter	1 filter		X	X	X															
080820-6-12	8-Aug-20	Filter	1 filter		X	X	X															
090820-1-13	9-Aug-20	Filter	1 filter		X	X	X															
090820-2-14	9-Aug-20	Filter	1 filter		X	X	X															
090820-3-15	9-Aug-20	Filter	1 filter		X	X	X															
090820-4-16	9-Aug-20	Filter	1 filter		X	X	X															
090820-5-17	9-Aug-20	Filter	1 filter		X	X	X															
090820-6-18	9-Aug-20	Filter	1 filter		X	X	X															

Sample Relinquished By (print name & sign) Elizabeth Robinson	Date/Time 18-Aug-20	Samples Received By (print name and sign)	Date/Time	Special Instructions
Sample Relinquished By (print name & sign)	Date/Time	Samples Received By (print name and sign)	Date/Time	

Elizabeth Robinson



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Fax: 902-468-8924
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Laboratory use Only

Arrival Condition: Good Poor (complete 'notes')
Arrival Temperature: _____ AGAT Job Number: _____
Notes: _____

Drinking Water Sample (y/n): _____ Reg. No. _____
Waterworks Number: _____

Report To: Company: Wood E & IS Contact: Kim Green Address: 50 Troop Avenue Phone: 902-468-2848 FAX: 902-468-1314 PO#: AGAT Quotation: Client Project #: TE201029		Report Information 1. Name: Kim Green Email: kimberlea.green@woodpic.com 2. Name: Elizabeth Robinson Email: elizabeth.robinson@woodpic.com		Report Format <input type="checkbox"/> Single PDF sample per page <input checked="" type="checkbox"/> Multiple PDF samples per page <input checked="" type="checkbox"/> Excel Format Included		Turnaround Time (TAT) Business Days Regular TAT: X 5 - 7 days Rush TAT: <input type="checkbox"/> 1 day <input type="checkbox"/> 2 days <input checked="" type="checkbox"/> 3 - 4 days Date Required: _____ Time Required: _____	
Invoice to: Same (Y/N) - Circle Company: SAME Contact: Denise Hirtle Address: Phone: _____ Fax: _____ PO#/Credit Card #: _____		Regulatory Requirements (Check): <input type="checkbox"/> List Guidelines on Report <input type="checkbox"/> Do Not List Guidelines on Report <input type="checkbox"/> PIRI Site Info (check all that apply): <input type="checkbox"/> Teir 1 <input type="checkbox"/> Res. <input type="checkbox"/> Pot. <input type="checkbox"/> Coarse <input type="checkbox"/> Teir 2 <input type="checkbox"/> Com <input type="checkbox"/> N/Pot. <input type="checkbox"/> Fine <input type="checkbox"/> Gas <input type="checkbox"/> Fuel <input type="checkbox"/> Lube <input type="checkbox"/> CCME <input type="checkbox"/> CDWQ <input type="checkbox"/> Ind <input type="checkbox"/> NSDFOSP <input type="checkbox"/> Com <input type="checkbox"/> HRM 101 <input type="checkbox"/> Res/P <input type="checkbox"/> Storm Water <input type="checkbox"/> Ag <input type="checkbox"/> HRM 101 <input type="checkbox"/> FWAL <input type="checkbox"/> Waste Water <input type="checkbox"/> Sediment <input type="checkbox"/> Other					

SAMPLE IDENTIFICATION	DATE / TIME SAMPLED	SAMPLE MATRIX	# OF CONTAINERS	COMMENTS - Site/Sample Info, Sample Containment	TSP	Mercury	Arsenic														Lab Sample #
100820-1-19	10-Aug-20	Filter	1 filter		X	X	X														
100820-2-20	10-Aug-20	Filter	1 filter		X	X	X														
100820-3-21	10-Aug-20	Filter	1 filter		X	X	X														
100820-4-22	10-Aug-20	Filter	1 filter		X	X	X														
100820-5-23	10-Aug-20	Filter	1 filter		X	X	X														
100820-6-24	10-Aug-20	Filter	1 filter		X	X	X														
110820-1-25	11-Aug-20	Filter	1 filter		X	X	X														
110820-2-26	11-Aug-20	Filter	1 filter		X	X	X														
110820-3-27	11-Aug-20	Filter	1 filter		X	X	X														

Sample Relinquished By (print name & sign) Elizabeth Robinson	Date/Time 18-Aug-20	Samples Received By (print name and sign)	Date/Time	Special Instructions
Sample Relinquished By (print name & sign)	Date/Time	Samples Received By (print name and sign)	Date/Time	
		Page		3 of 5



Unit 122 - 11 Morris Dr.
 Dartmouth, Nova Scotia
 B3B 1M2
 http://webearth.agatlabs.com

Phone: 902-468-8718
 Fax: 902-468-8924
 www.agatlabs.com

Laboratory use Only
 Arrival Condition: Good Poor (complete 'notes')
 Arrival Temperature: _____ AGAT Job Number: _____
 Notes: _____

Drinking Water Sample (y/n): _____ Reg. No. _____
 Waterworks Number: _____

Report To:
 Company: Wood E & IS
 Contact: Kim Green
 Address: 50 Troop Avenue
 Phone: 902-468-2848 FAX: 902-468-1314
 PO#:
 AGAT Quotation:
 Client Project #: TE201029
Invoice to: Same (Y/N) - Circle
 Company: SAME
 Contact: Denise Hirtle
 Address:
 Phone: _____ Fax: _____
 PO#/Credit Card #:

Report Information
 1. Name: Kim Green
 Email: kimberlea.green@woodpic.com
 2. Name: Elizabeth Robinson
 Email: elizabeth.robinson@woodpic.com

Regulatory Requirements (Check):
 List Guidelines on Report Do Not List Guidelines on Report
 PIR Site Info (check all that apply):
 Teir 1 Res. Pot. Coarse
 Teir 2 Com N/Pot. Fine
 Gas Fuel Lube
 CCME CDWQ
 Ind NSDFOSP
 Com HRM 101
 Res/P Storm Water
 Ag HRM 101
 FWAL Waste Water
 Sediment
 Other

Report Format
 Single PDF sample per page
 Multiple PDF samples per page
 Excel Format Included

Turnaround Time (TAT) Business Days
Regular TAT:
 5 - 7 days
Rush TAT:
 1 day 2 days
 3 - 4 days
 Date Required: _____
 Time Required: _____

SAMPLE IDENTIFICATION	DATE / TIME SAMPLED	SAMPLE MATRIX	# OF CONTAINERS	COMMENTS - Site/Sample Info, Sample Containment	TSP	Mercury	Arsenic													Lab Sample #
110820-4-28	11-Aug-20	Filter	1 filter		X	X	X													
110820-5-29	11-Aug-20	Filter	1 filter		X	X	X													
110820-6-30	11-Aug-20	Filter	1 filter		X	X	X													
120820-1-31	12-Aug-20	Filter	1 filter		X	X	X													
120820-2-32	12-Aug-20	Filter	1 filter		X	X	X													
120820-3-33	12-Aug-20	Filter	1 filter		X	X	X													
120820-4-34	12-Aug-20	Filter	1 filter		X	X	X													
120820-6-36	12-Aug-20	Filter	1 filter		X	X	X													

Sample Relinquished By (print name & sign)	Date/Time	Samples Received By (print name and sign)	Date/Time	Special Instructions
Elizabeth Robinson	18-Aug-20			
Sample Relinquished By (print name & sign)	Date/Time	Samples Received By (print name and sign)	Date/Time	



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Laboratory use Only

Arrival Condition: Good Poor (complete 'notes')

Arrival Temperature: _____ AGAT Job Number: _____

Notes: _____

Drinking Water Sample (y/n): _____ Reg. No. _____

Waterworks Number: _____

Report To: Company: Wood E & IS Contact: Kim Green Address: 50 Troop Avenue Phone: 902-468-2848 FAX: 902-468-1314 PO#: _____ AGAT Quotation: _____ Client Project #: TE201029		Report Information 1. Name: Kim Green Email: kimberlea.green@woodpic.com 2. Name: Elizabeth Robinson Email: elizabeth.robinson@woodpic.com		Report Format <input type="checkbox"/> Single PDF sample per page <input checked="" type="checkbox"/> Multiple PDF samples per page <input checked="" type="checkbox"/> Excel Format Included		Turnaround Time (TAT) Business Days Regular TAT: <input checked="" type="checkbox"/> 5 - 7 days Rush TAT: <input type="checkbox"/> 1 day <input type="checkbox"/> 2 days <input type="checkbox"/> 3 - 4 days Date Required: _____ Time Required: _____	
Invoice to: Same (Y/N) - Circle Company: SAME Contact: Denise Hirtle Address: _____ Phone: _____ Fax: _____ PO#/Credit Card #: _____		Regulatory Requirements (Check): <input type="checkbox"/> List Guidelines on Report <input type="checkbox"/> Do Not List Guidelines on Report <input type="checkbox"/> PIRI <input type="checkbox"/> Site Info (check all that apply): <input type="checkbox"/> Teir 1 <input type="checkbox"/> Res. <input type="checkbox"/> Pot. <input type="checkbox"/> Coarse <input type="checkbox"/> Teir 2 <input type="checkbox"/> Com <input type="checkbox"/> N/Pot. <input type="checkbox"/> Fine <input type="checkbox"/> Gas <input type="checkbox"/> Fuel <input type="checkbox"/> Lube <input type="checkbox"/> CCME <input type="checkbox"/> CDWQ <input type="checkbox"/> Ind <input type="checkbox"/> NSDFOSP <input type="checkbox"/> Com <input type="checkbox"/> HRM 101 <input type="checkbox"/> Res/P <input type="checkbox"/> Storm Water <input type="checkbox"/> Ag <input type="checkbox"/> HRM 101 <input type="checkbox"/> FWAL <input type="checkbox"/> Waste Water <input type="checkbox"/> Sediment <input type="checkbox"/> Other _____					

SAMPLE IDENTIFICATION	DATE / TIME SAMPLED	SAMPLE MATRIX	# OF CONTAINERS	COMMENTS - Site/Sample Info, Sample Containment	TSP	Mercury	Arsenic														Lab Sample #
130820-1-37	13-Aug-20	Filter	1 filter		X	X	X														
130820-2-38	13-Aug-20	Filter	1 filter		X	X	X														
130820-3-39	13-Aug-20	Filter	1 filter		X	X	X														
130820-4-40	13-Aug-20	Filter	1 filter		X	X	X														
130820-6-42	13-Aug-20	Filter	1 filter		X	X	X														
140820-5-43	14-Aug-20	Filter	1 filter		X	X	X														
080820-TB	8-Aug-20	Filter	1 filter		X	X	X														
120820-FB	12-Aug-20	Filter	1 filter		X	X	X														

Sample Relinquished By (print name & sign) Elizabeth Robinson	Date/Time 18-Aug-20	Samples Received By (print name and sign)	Date/Time	Special Instructions
Sample Relinquished By (print name & sign)	Date/Time	Samples Received By (print name and sign)	Date/Time	

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, a div. of
Wood Canada Ltd.
50 TROOP AVENUE, UNIT 300
DARTMOUTH, NS B3B1Z1
(902) 468-2848

ATTENTION TO: Kim Green

PROJECT: TE201029

AGAT WORK ORDER: 20X645464

AIR QUALITY MONITORING REVIEWED BY: Marta Manka, Data Reporter

SOIL ANALYSIS REVIEWED BY: Marta Manka, Data Reporter

DATE REPORTED: Sep 21, 2020

PAGES (INCLUDING COVER): 8

VERSION*: 2

Should you require any information regarding this analysis please contact your client services representative at (902) 468-8718

***Notes**

VERSION 2: This report supersedes all previous reports. It has been updated to reflect the analytical comment for background metals subtraction for the filter analysis. Method blank filter results for metals are also included in the QA/QC section.

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

Certificate of Analysis

AGAT WORK ORDER: 20X645464

PROJECT: TE201029

 11 Morris Drive, Unit 122
 Dartmouth, Nova Scotia
 CANADA B3B 1M2
 TEL (902)468-8718
 FAX (902)468-8924
<http://www.agatlabs.com>

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, a div. of Wood Canada Ltd.

ATTENTION TO: Kim Green

SAMPLING SITE:

SAMPLED BY:

Metals on Filter Paper (ug/filter)

DATE RECEIVED: 2020-09-02

DATE REPORTED: 2020-09-21

SAMPLE DESCRIPTION: 130820-5-41

SAMPLE TYPE: Air

DATE SAMPLED: 2020-08-13

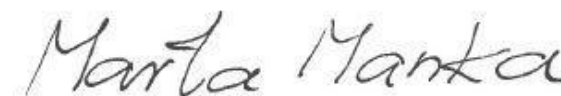
Parameter	Unit	G / S	RDL	1408616
Aluminum	µg/filter		2	1720
Antimony	µg/filter		0.025	<0.025
Arsenic	µg/filter		0.05	14.9
Barium	µg/filter		0.1	11.8
Beryllium	µg/filter		0.025	<0.025
Bismuth	µg/filter		0.025	<0.025
Boron	µg/filter		0.5	6.1
Cadmium	µg/filter		0.015	0.094
Chromium	µg/filter		0.05	3.59
Cobalt	µg/filter		0.05	1.52
Copper	µg/filter		0.1	341
Iron	µg/filter		2.5	2770
Lead	µg/filter		0.025	4.34
Manganese	µg/filter		0.05	79.6
Molybdenum	µg/filter		0.05	17.3
Nickel	µg/filter		0.15	5.88
Selenium	µg/filter		0.025	1.18
Silver	µg/filter		0.025	0.199
Strontium	µg/filter		0.1	2.40
Thallium	µg/filter		0.015	0.037
Tin	µg/filter		0.05	<0.05
Titanium	µg/filter		0.05	49.4
Uranium	µg/filter		0.015	0.097
Vanadium	µg/filter		0.1	2.3
Zinc	µg/filter		0.45	15.8

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

1408616 Metals on filter paper results are blank corrected.

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:





Certificate of Analysis

AGAT WORK ORDER: 20X645464

PROJECT: TE201029

11 Morris Drive, Unit 122
 Dartmouth, Nova Scotia
 CANADA B3B 1M2
 TEL (902)468-8718
 FAX (902)468-8924
<http://www.agatlabs.com>

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, a div. of Wood Canada Ltd.

ATTENTION TO: Kim Green

SAMPLING SITE:

SAMPLED BY:

Particulate on Filter Paper (TSP)

DATE RECEIVED: 2020-09-02

DATE REPORTED: 2020-09-21

SAMPLE DESCRIPTION: 130820-5-41

SAMPLE TYPE: Air

DATE SAMPLED: 2020-08-13

Parameter	Unit	G / S	RDL	1408616
Total Suspended Particulate	mg		10	120

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:

Marla Manka



Certificate of Analysis

AGAT WORK ORDER: 20X645464

PROJECT: TE201029

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
<http://www.agatlabs.com>

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, a div. of Wood Canada Ltd.

ATTENTION TO: Kim Green

SAMPLING SITE:

SAMPLED BY:

Métaux Extractibles Totaux (air) µg

DATE RECEIVED: 2020-09-02

DATE REPORTED: 2020-09-21

SAMPLE DESCRIPTION: 130820-5-41

SAMPLE TYPE: Air

DATE SAMPLED: 2020-08-13

Parameter	Unit	G / S	RDL	1408616
Mercury	µg	0.05	<0.05	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

1408616 Une LDR plus élevée indique qu'une dilution a été effectuée afin de réduire la concentration des analytes ou de réduire l'interférence de la matrice.

Analysis performed at AGAT Montreal (unless marked by *)

Certified By:

Quality Assurance

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, a div. of AGAT WORK ORDER: 20X645464
 PROJECT: TE201029 ATTENTION TO: Kim Green
 SAMPLING SITE: SAMPLED BY:

Air Quality Monitoring

RPT Date: Sep 21, 2020			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper		Lower	Upper		Lower	Upper	

Metals on Filter Paper (ug/filter)

Aluminum	1389707	1389707	146	296	67.9%	30	103%	80%	120%	107%	80%	120%	NA	70%	130%
Antimony	1389707	1389707	0.476	0.556	15.5%	0.155	87%	80%	120%	98%	80%	120%	82%	70%	130%
Arsenic	1389707	1389707	0.22	0.02	NA	0.27	100%	80%	120%	103%	80%	120%	85%	70%	130%
Barium	1389707	1389707	5.2	6.2	17.5%	6.4	93%	80%	120%	92%	80%	120%	96%	70%	130%
Beryllium	1389707	1389707	0.255	0.395	43.1%	0.057	103%	80%	120%	104%	80%	120%	103%	70%	130%
Bismuth	1389707	1389707	0.023	0.032	NA	0.058	103%	80%	120%	110%	80%	120%	95%	70%	130%
Boron	1389707	1389707	298	466	44.0%	2.8	103%	80%	120%	108%	80%	120%	NA	70%	130%
Cadmium	1389707	1389707	0.089	0.097	8.6%	< 0.015	99%	80%	120%	98%	80%	120%	81%	70%	130%
Chromium	1389707	1389707	< 0.05	< 0.05	NA	1.55	94%	80%	120%	95%	80%	120%	93%	70%	130%
Cobalt	1389707	1389707	0.07	0.10	NA	0.03	97%	80%	120%	98%	80%	120%	94%	70%	130%
Copper	1389707	1389707	500	484	3.3%	5.3	100%	80%	120%	104%	80%	120%	93%	70%	130%
Iron	1389707	1389707	147	144	2.1%	< 2.5	91%	80%	120%	98%	80%	120%	93%	70%	130%
Lead	1389707	1389707	1.54	1.78	14.5%	0.463	108%	80%	120%	112%	80%	120%	100%	70%	130%
Manganese	1389707	1389707	13.2	13.2	0.0%	0.57	95%	80%	120%	99%	80%	120%	94%	70%	130%
Molybdenum	1389707	1389707	23.8	22.9	3.9%	0.43	95%	80%	120%	99%	80%	120%	92%	70%	130%
Nickel	1389707	1389707	0.57	0.80	NA	1.98	96%	80%	120%	101%	80%	120%	95%	70%	130%
Selenium	1389707	1389707	< 0.025	< 0.025	NA	< 0.025	95%	80%	120%	93%	80%	120%	81%	70%	130%
Silver	1389707	1389707	0.239	0.205	15.3%	0.034	101%	80%	120%	100%	80%	120%	92%	70%	130%
Strontium	1389707	1389707	3.0	3.2	6.5%	0.2	94%	80%	120%	98%	80%	120%	99%	70%	130%
Thallium	1389707	1389707	< 0.015	0.016	NA	<0.015	112%	80%	120%	117%	80%	120%	104%	70%	130%
Tin	1389707	1389707	< 0.05	< 0.05	NA	13.10	94%	80%	120%	97%	80%	120%	88%	70%	130%
Titanium	1389707	1389707	3.66	5.84	45.9%	0.67	100%	80%	120%	106%	80%	120%	103%	70%	130%
Uranium	1389707	1389707	< 0.015	< 0.015	NA	< 0.015	108%	80%	120%	113%	80%	120%	105%	70%	130%
Vanadium	1389707	1389707	0.3	0.4	NA	< 0.1	91%	80%	120%	94%	80%	120%	91%	70%	130%
Zinc	1389707	1389707	6.87	7.96	14.7%	5.68	94%	80%	120%	99%	80%	120%	92%	70%	130%

Certified By: 

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.

Results relate only to the items tested. Results apply to samples as received.

Quality Assurance

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, a div. of AGAT WORK ORDER: 20X645464
 PROJECT: TE201029 ATTENTION TO: Kim Green
 SAMPLING SITE: SAMPLED BY:

Soil Analysis															
RPT Date: Sep 21, 2020			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE		MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Métaux Extractibles Totaux (air) µg																
Mercury	1		NA	NA	0.0%	< 0.05	NA	70%	130%	103%	80%	120%	NA	70%	130%	

Comments: NA : Non applicable

NA dans l'écart du duplicata indique que l'écart n'a pu être calculé car l'un ou les deux résultats sont < 5x LDR.

NA dans le pourcentage de récupération de l'échantillon fortifié indique que le résultat n'est pas fourni en raison de la concentration trop élevée par rapport à l'ajout.

NA dans le blanc fortifié ou le MRC indique qu'il n'est pas requis par la procédure.

Le pourcentage de récupération du MRC peut être en dehors du critère d'acceptabilité s'il est conforme à l'écart du certificat du matériau de référence.

L'écart acceptable est applicable pour 90% des composés. Pour les 10% des composés restants, un écart de 10% supplémentaire est acceptable.

Certified By: Marla Manka

Method Summary

CLIENT NAME: WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, a div. of AGAT WORK ORDER: 20X645464
 PROJECT: TE201029 ATTENTION TO: Kim Green
 SAMPLING SITE: SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Air Quality Monitoring			
Aluminum	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Antimony	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Arsenic	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Barium	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Beryllium	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Bismuth	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Boron	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Cadmium	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Chromium	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Cobalt	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Copper	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Iron	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Lead	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Manganese	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Molybdenum	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Nickel	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Selenium	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Silver	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Strontium	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Thallium	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Tin	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP/MS
Titanium	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP/MS
Uranium	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP/MS
Vanadium	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Zinc	MET-121-6015 & MET-121-6112	modified from SM 3125 & NIOSH 7303	ICP-MS
Total Suspended Particulate	INOR-121-6041	Modified EPA Method 5	GRAVIMETRIC
Soil Analysis			
Mercury	MET-101-6102F, not accredited by MDDELCC	MA. 200 Hg 1.1; NIOSH 6009	CV/AA



Unit 122 - 11 Morris Dr,
Dartmouth, Nova Scotia
B3B 1M2
http://webearth.agatlabs.com

Phone: 902-468-8718
Fax: 902-468-8924
www.agatlabs.com

Laboratory use Only
 Arrival Condition: Good Poor (complete 'notes')
 Arrival Temperature: 23.0 AGAT Job Number: 20X645464
 Notes:

Drinking Water Sample (y/n): _____ Reg. No. _____
 Waterworks Number: _____

Report To: Company: Wood E & IS Contact: Kim Green Address: 50 Troop Avenue Phone: <u>902-468-2848</u> FAX: <u>902-468-1314</u> PO#: AGAT Quotation: Client Project #: <u>TE201029</u> Invoice to: Same (Y/N) - Circle Company: SAME Contact: Denise Hirtle Address: Phone: _____ Fax: _____ PO#/Credit Card #: _____	Report Information 1. Name: Kim Green Email: kimberlea.green@woodpic.com 2. Name: Elizabeth Robinson Email: elizabeth.robinson@woodpic.com	Report Format <input type="checkbox"/> Single PDF sample per page <input checked="" type="checkbox"/> Multiple PDF samples per page <input checked="" type="checkbox"/> Excel Format Included	Turnaround Time (TAT) Business Days Regular TAT: <input checked="" type="checkbox"/> 5 - 7 days Rush TAT: <input type="checkbox"/> 1 day <input type="checkbox"/> 2 days <input checked="" type="checkbox"/> 3 - 4 days Date Required: _____ Time Required: _____																																								
	Regulatory Requirements (Check): <input type="checkbox"/> List Guidelines on Report <input type="checkbox"/> Do Not List Guidelines on Report <input type="checkbox"/> PIRI Site Info (check all that apply): <input type="checkbox"/> Teir 1 <input type="checkbox"/> Res <input type="checkbox"/> Pot. <input type="checkbox"/> Coarse <input type="checkbox"/> Teir 2 <input type="checkbox"/> Com <input type="checkbox"/> N/Pot <input type="checkbox"/> Fine <input type="checkbox"/> Gas <input type="checkbox"/> Fuel <input type="checkbox"/> Lube <input type="checkbox"/> CCME <input type="checkbox"/> CDWQ <input type="checkbox"/> Ind <input type="checkbox"/> NSDFOSP <input type="checkbox"/> Com <input type="checkbox"/> HRM 101 <input type="checkbox"/> Res/P Storm Water <input type="checkbox"/> Ag <input type="checkbox"/> HRM 101 <input type="checkbox"/> FWAL Waste Water <input type="checkbox"/> Sediment <input type="checkbox"/> Other		20 SEP 2 10:58 AM																																								
	<table border="1"> <thead> <tr> <th>TSP</th> <th>Mercury</th> <th>Arsenic</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>Lab Sample #</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				TSP	Mercury	Arsenic																	Lab Sample #	X	X	X																
TSP	Mercury	Arsenic																	Lab Sample #																								
X	X	X																																									

SAMPLE IDENTIFICATION	DATE / TIME SAMPLED	SAMPLE MATRIX	# OF CONTAINERS	COMMENTS - Site/Sample Info, Sample Containment	TSP	Mercury	Arsenic												
130820-5-41	13-Aug-20	Filter	1 filter		X	X	X												

Sample Relinquished By (print name & sign) Elizabeth Robinson	Date/Time 16-Aug-20 25 Sept	Samples Received By (print name and sign)	Date/Time	Special Instructions
Sample Relinquished By (print name & sign) <i>Agat Team</i>	Date/Time 10:40	Samples Received By (print name and sign)	Date/Time	

Appendix C.3

Dam Safety Inspections



**Spring 2020 Dam Safety
Inspection, Touquoy Mine TMF**

June 30, 2020

Prepared for:

Atlantic Mining Nova Scotia Inc.
Moose River Gold Mine
6749 Moose River Rd,
Middle Musquodoboit, NS B0N 1X0

Prepared by:

Stantec Consulting Ltd.
141 Kelsey Drive
St. John's, NL A1B 0L2
Tel: (709) 576-1458
Fax: (709) 576-2126

File No: 121619250

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LIST OF APPENDICES

- Appendix A Statement of Report Limitations and General Conditions
- Appendix B Dam Safety Inspection Checklist Report and Site Photos



SPRING 2020 DAM SAFETY INSPECTION, TOUQUOY MINE TMF

Introduction

June 30, 2020

1.0 INTRODUCTION

Atlantic Mining Nova Scotia Inc. (AMNS) has retained Stantec Consulting Limited (Stantec) to conduct a Dam Safety Inspection (DSI) of the Touquoy Tailings Management Facility (TMF) located at the Moose River Gold Mine, Middle Musquodoboit, NS. The DSI was completed in June 2020.

As per Industrial Approval (IA) 2012-08244-05, dated July 20, 2018, a DSI is to be completed twice per year at the site. This report represents the first DSI for 2020.

In general, the DSI was completed in accordance with Section 3.6.2 of the Canadian Dam Association (CDA) Guidelines; subsection “Engineering Inspections”. CDA notes that an engineering inspection is limited to a visual examination of the dam and the instrumentation used to monitor the dam performance. The inspection documents observations regarding the condition of the dam and highlights any “significant” changes from the previous inspections.

2.0 APPLICABLE GUIDELINES AND BEST MANAGEMENT PRACTICES

In Nova Scotia, guidelines, and best management practices for Dam Safety Inspections (DSIs) comprise:

- Canadian Dam Association (CDA)
 - 2007 Dam Safety Guidelines, as revised in 2013;
 - 2014 Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams and 2016 update; and;
 - Other relevant CDA Technical Bulletins.
- Mining Association of Canada (MAC)
 - A Guide to the Management of Tailings Facilities, Version 3.1 (2019)
 - Developing an Operation, Maintenance, and Surveillance Manual for Tailings and Water Management Facilities, Second Edition, (2019)

3.0 SITE DESCRIPTION AND BACKGROUND

3.1 GENERAL

The Touquoy Mine, owned and operated by AMNS, is an open pit gold mine with milling capabilities. The mine is located approximately 100-kilometer (km) northeast of Halifax in the Moose River Gold Mines District in Halifax County, Nova Scotia, Canada. The site is accessible by vehicle access road. General site Plan is shown below in Figure 1.



SPRING 2020 DAM SAFETY INSPECTION, TOUQUOY MINE TMF

Site Description and Background
June 30, 2020

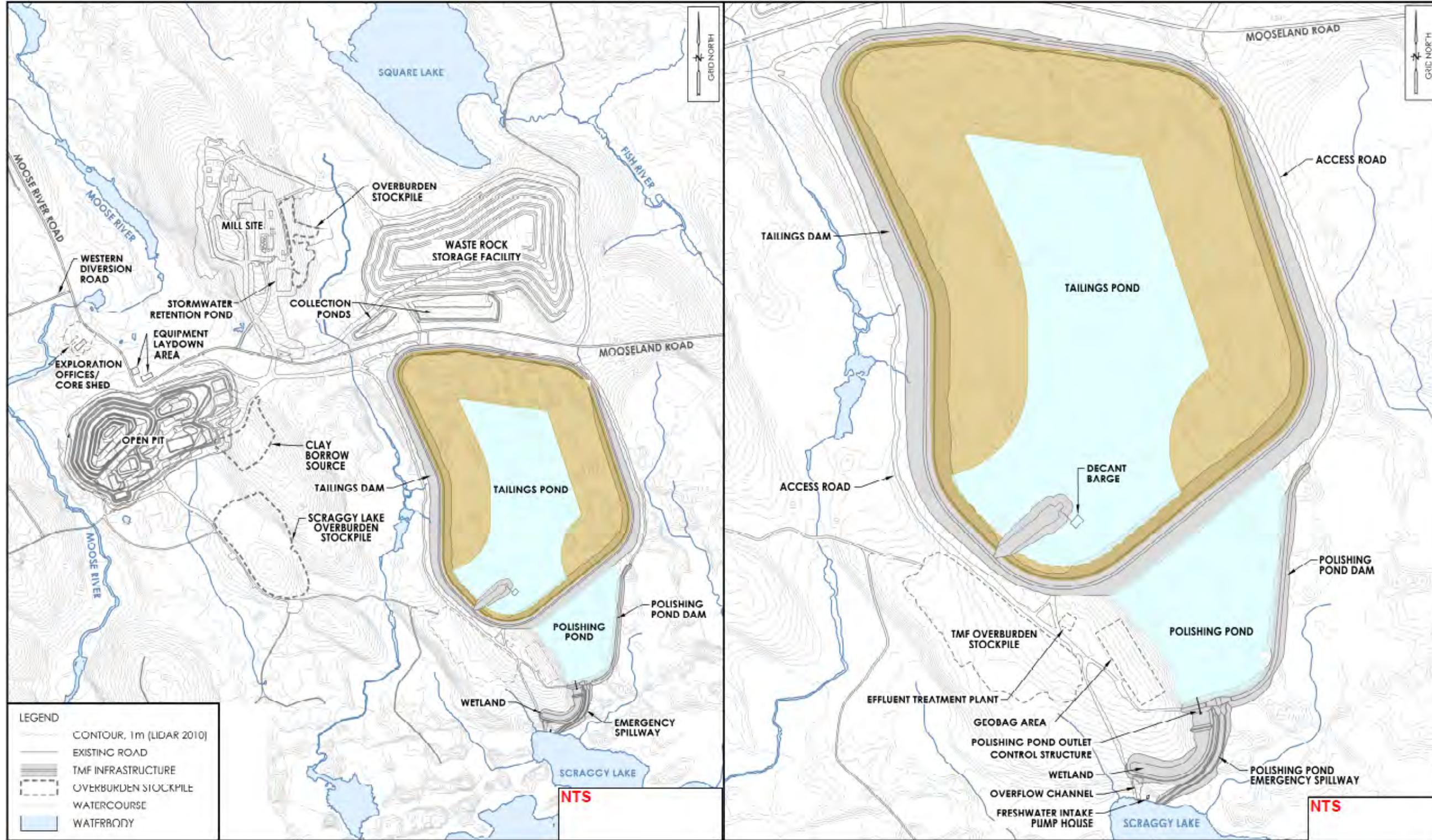


Figure 1 - Site Plan (copied from OMS Manual)

SPRING 2020 DAM SAFETY INSPECTION, TOUQUOY MINE TMF

Site Description and Background

June 30, 2020

3.2 TMF DESCRIPTION

The Touquoy TMF is situated in the south-east area of the Touquoy Gold Project, south of the mill and waste rock storage facility. The project development is comprised of a mill, tailings pipelines, tailings pond, polishing pond, a constructed wetland, and associated facilities described herein.

The tailings are processed in the onsite mill. The tailings are transported from the mill to the tailings pond in a double walled HDPE pipeline within a secondary containment ditch. Reclaim water for the mill is made up of water from the tailings pond and water from Scraggy Lake. Discharge from the tailings pond is treated at an Effluent Treatment Plant (ETP) which provides metals removal, solids removal and pH control. From the ETP, water is directed to geobags which provide additional solids and metal capture prior to release to the polishing pond. The Polishing Pond has a dam constructed with an upstream sloping clay till core, waste rock shell, and associated filters, is located downstream of the tailings pond and provides additional water retention time. Discharge of treated effluent from the polishing pond is controlled via the final discharge point (FDP) control structure. Effluent is discharged to a constructed wetland downstream of the polishing pond which provides a final polishing step prior to release to the natural environment (Scraggy Lake).

The tailings pond is enclosed by an approximately 3,400 meters long tailings dam. The dam is being constructed using the downstream raise method, with an upstream sloping clay till core, waste rock shell, associated filters, and slope protection. The tailings pond manages the runoff from the contributing TMF catchment, tailings discharge slurry, seepage collection ditches, historical tailings and the water retained in the tailings' voids. Runoff from the mill site, open pit, and waste rock storage facility also discharges to the TMF. Seepage collection ditches along the east, west, and recently completed, along the north edges of the TMF are designed to collect surface runoff and shallow seepage and pump it back into the tailings pond.

3.1 KEY OPERATING STRUCTURES

The TMF includes the following infrastructure that are closely related to the operation, maintenance, and surveillance of the TMF.

- Tailings Dam and Associated Structures
 - Water reclaim, tailings drainage, and seepage collection
 - Tailings delivery and distribution system
 - Effluent treatment plant and geobags
 - Instrumentation
- Polishing Pond Dam and Associated Structures
- Engineered Wetland and Associated Structures

3.2 PREVIOUS DAM SAFETY INSPECTIONS

The previous DSI was completed by Stantec in December 2019.



SPRING 2020 DAM SAFETY INSPECTION, TOUQUOY MINE TMF

DSI Methodology and Observations

June 30, 2020

4.0 DSI METHODOLOGY AND OBSERVATIONS

4.1 METHODOLOGY

The site inspection was conducted by Mr. Sean McOuat and Mr. Dan McQuinn, P. Eng. of Stantec on June 11, 2019. Subsequent follow up site visits to obtain additional photographs were completed on July 2, 9, and 28, 2020.

At the time of the inspection, construction of the TMF is ongoing with fulltime inspection of the construction activities by Stantec and review by Mr. Deering as Engineer of Record (EOR). In addition to the information presented herein, additional daily photographs and records of construction activities are within Stantec's project files and have been issued to AMNS.

The DSI was completed in accordance with Section 3.6.2 of the Canadian Dam Association (CDA) Guidelines; subsection "Engineering Inspections".

The DSI involved a walk over reconnaissance survey of the dam with specific attention paid to the crest, downstream slopes and toe area, and the exposed portions of the upstream slopes. Detailed observations were made for any signs of cracking, settlement, erosion, movement, seepage, and other items such as vegetation growth and animal burrows. No subsurface investigations to examine the soil conditions for the structures were conducted at the time of the site inspection.

Although the previously mentioned key elements of operating the facility are listed above, for the purpose of this report, the DSI was broken into the following parts for the inspection and checklists.

- Tailings Dam and Associated Structures
 - Water reclaim, tailings drainage, and seepage collection
 - Tailings delivery and distribution system
 - Effluent treatment plant and geobags
 - Instrumentation
- Polishing Pond Dam and Associated Structures
- Engineered Wetland and Associated Structures



SPRING 2020 DAM SAFETY INSPECTION, TOUQUOY MINE TMF

DSI Methodology and Observations

June 30, 2020

4.2 SITE OBSERVATIONS

The results of the field observations are documented in the Dam Safety Inspection Checklist Reports and Photos (Appendix B) and summarized below:

- Overall, the crest and slopes of the ponds are in good condition with no signs of cracking, excessive settlement, erosion, or movement.
- There was no evidence of overtopping.
- The downstream and upstream slopes were observed to be stable with no signs of slope instability.
- No evidence of cloudy or muddy seepage.
- The water level in the pond was below the max operational levels as per the OMS/EPRP.
- The downstream slope of the east TMF dam exhibits an irregular slope surface (Photographs 34 through 36). Based on a review of the as-builts and daily report, this area appears to have been constructed with this geometry. Monitoring this section of the slope required.
- Tailings deposition is ongoing on the west side of the pond through spigot holes cut in the side of the tailings pipe resting at the edge of the pond and end of pipe deposition. (Photographs 67 through 69).
- The ETP was operating at the time of inspection on June 11 and was temporarily shut down on July 20 (Photographs 57 through 66).
- Piezometers are installed and data collected on a regular basis (Photograph 40).
- Flow from the engineered wetland is quite evenly distributed across the downstream crest within the rockfill. However, there is a concentration of flow subsequently directed to the area of the Scraggy Lake intake pump house which is causing some scour beneath the structure (Photographs 53 through 55)
- The emergency spillway for the engineered wetland has evidently been disturbed from traffic and equipment. Grades and materials should be checked against design and repaired, as necessary (Photographs 50 through 52).

4.3 REVIEW OF INSTRUMENTATION

Instrumentation consists of piezometers in the dam structure. Data from the instrumentation was reviewed and confirm that conditions are within the anticipated levels. Instrumentation results are reviewed regularly and submitted under separate cover.



SPRING 2020 DAM SAFETY INSPECTION, TOUQUOY MINE TMF

Conclusions and Recommendations

June 30, 2020

5.0 CONCLUSIONS AND RECOMMENDATIONS

The dam safety inspection carried out by Stantec did not note any evidence of crest settlement, slope instabilities or excessive seepage at the Touquoy tailings management facility and associated structures. Thus, the inspection did not find any significant issues concerning the overall safety of the Tailings Dam, Polishing Pond Dam, and Wetland Berm.

Based on Stantec's June 2020 DSI, recommendations have been provided in Table 5.1 below. The recommendations provided in Table 5.1 are based on the following criteria:

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

Table 5.1 June 2020 DSI Recommendations

Item	Observation	Recommendation	Priority	Timeframe
1	Geobag discharge collection ditch requires additional rip rap erosion protection. Appendix B Photo 60	Occasional high flows from the geobags occur when "banging" after excessive inflation. A) ensure that the geobags are monitored and serviced frequently; B) add riprap to a small section of collection ditch at the east end of Bag 4 to protect against inadvertent high flows.	2	2020
2	Eastern portions of the north seepage ditch must be completed prior to further raising of the pond level	Complete this section as per design recommendations	2	2020
3	The downstream slope of the east TMF dam exhibits an irregular slope surface	Monitoring of area required. It appears that the	BMP	N/A
4	There is a concentration of flow from the engineered wetland to the Scraggy Lake intake pumphouse which is causing some scour beneath the structure.	Redirect the flow and repair the undermined area of the pump house.	2	Fall 2020
5	The emergency spillway for the engineered wetland has evidently been disturbed from traffic and equipment.	Grades and materials should be checked against design and repaired, as necessary.	2	Fall 2020
6	General Site conditions	Maintain as per OMS	BMP	Ongoing

Notes: BMP – Best Management Practice



SPRING 2020 DAM SAFETY INSPECTION, TOUQUOY MINE TMF

Closing Remarks

June 30, 2020

6.0 CLOSING REMARKS

Use of this report is subject to the Statement of Report Limitations General Conditions in Appendix A. It is the responsibility of Atlantic Mining NS Inc., who is identified as “the Client” within the Statement of Report Limitations General Conditions, and its agents to review the conditions and to notify Stantec should any of these not be satisfied.

The observations, comments, and recommendations included herein are based on the visual inspection of the Touquoy TMF carried out on June 11, 2020. This report is based on the observations of visible conditions of the structures, identified during the site visit and may not include conditions that became visible after the visit.

This report was prepared by Dan McQuinn, P.Eng., and reviewed by Paul Deering, P.Eng. Should you have any comments or clarifications regarding the above report, please do not hesitate to contact the undersigned at your convenience.

Yours Truly,

STANTEC CONSULTING LTD.



Paul D. Deering, P.Eng., P.Geo.
Geotechnical Engineer



Dan McQuinn, P.Eng.
Geotechnical Engineer



APPENDIX A

Statement of Report Limitations and General Conditions

STATEMENT OF REPORT LIMITATIONS AND GENERAL CONDITIONS

This document entitled *Spring 2020 Dam Safety Inspection* was prepared by Stantec Consulting Ltd. ("Stantec") for the account of Atlantic Mining NS Inc. (the "Client").

USE OF THIS REPORT: This report has been prepared for the sole benefit of the Client and may not be used by any third party without the express written consent of Stantec. Any use which a third party makes of this report is the responsibility of such third party.

STANDARD OF CARE: Preparation of this report, and associated work, was carried out in accordance with the reasonable skill and diligence required by customarily accepted professional practices and procedures normally provided in the performance of such services at the time when and the location in which the services were performed. No other warranty is made.

RELIANCE ON DATA: In preparing this report, Stantec has utilized information and data obtained from the Client, public and/or industry sources. Stantec has relied upon the information and data without independent verification, except only to the extent such verification was expressly included in the Services.

LIMITED SCOPE: The reported condition of the Tailings Pond Dam, Polishing Pond Dam and Engineered Wetland is based on observations of field conditions made under normal operating conditions and water levels at the time of inspection, along with data available to the inspection team. It is critical to note that the condition of the Tailings Pond Dam, Polishing Pond Dam and Engineered Wetland depends on numerous and constantly changing internal and external conditions and is evolutionary in nature. It would be incorrect to assume that the present condition of the Tailings Pond Dam, Polishing Pond Dam and Engineered Wetland will continue to represent the condition of the structures at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Stantec disclaims any liability for any latent defects or deficiencies which are not reasonably discoverable under generally accepted industry standards or that should reasonably have been identified pursuant to other applicable inspection criteria. Any assessments of the facilities are limited in terms of accuracy to the time, scope and purpose for which the assessment was prepared



APPENDIX B

Dam Safety Inspection Checklist Reports and Site Photos

DAM SAFETY INSPECTION CHECKLIST REPORT
2020 Dam Safety Inspection
TOUQUOY MINE TMF – TAILINGS POND DAM AND ASSOCIATED STRUCTURES

Project: Touquoy Mine Project			
Site Identification:	Touquoy Mine Site	Structure Identification:	Tailings Pond Dam and Associated Structures
Location:	Middle Musquodoboit, NS		
Inspection Date:	June 11, 2020	Inspection Time:	1:00 to 4:00 PM
Inspected by:	Sean McOuat Dan McQuinn	Accompanied by:	N/A
Inspection Type:	DSI <input checked="" type="checkbox"/> Special Event <input type="checkbox"/> Routine <input type="checkbox"/> Sampling <input type="checkbox"/> Other <input type="checkbox"/>		
Weather Conditions:	Inspection Day:	Overcast with shower	Temp.: +11 deg C
	Previous Week Avg.:	Variable	Temp. Range: 7 – 15 deg C
Date of Last DSI:	December 2019		
Structure Type:	Zoned earth fill dam	Spillway Details:	None
D/S Walk Over:	Yes	Spillway Invert Elev.	N/A
Exposed U/S Insp.:	Yes	Crest Elev.:	Approx 125.0 m
Discharge Fac. Insp.	No	Crest Width:	Approx 7.0 m
Pond Elev.:	123.0 m (estimated)	Max Height:	Approx 18.0 m
Current Freeboard:	3.5 m (estimated)	Dam Length:	3,400 m

Issues since Last DSI None Reported

AMNS TMF Drone Image



DAM SAFETY INSPECTION CHECKLIST REPORT			
Structure Identification: Tailings Pond Dam and Associated Structures			
Inspection Item	Concerns		Comments
	Y	N	
1. Dam Crest & Abutments			
1.1 Surface Cracking, Sinkholes, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.2 Excessive Differential Settlement	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.3 Lateral Movement	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.4 Erosion/Breaching/Washout	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.5 Liner Anchor Trench Movement	<input type="checkbox"/>	<input type="checkbox"/>	N/A
1.6 Visible Irregularities at Abutments	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.7 Undesirable Vegetation, Debris, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2. Upstream Slope			
2.1 Riprap Slope Benching, Ice Damage, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.2 Surface Erosion, Gullies, Slope Undercutting, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.3 Movement, Sloughing, Cracks, Irregularities, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.4 Exposed Liner Condition	<input type="checkbox"/>	<input type="checkbox"/>	N/A
2.5 Excessive Vegetation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.6 High Water Marks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.7 Other Unusual Conditions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Downstream Slope and Toe			
3.1 Surface Erosion (Gullies)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.2 Seepage, Wet Areas, Sand Boils, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.3 Signs of Movement, Cracks, Other Irregularities	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.4 Undesirable Vegetation Growth	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.5 Animal Burrows	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.6 Presence of Tailings Spills, Vegetation Kill, Ground Discoloration, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.7 Other Unusual Conditions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4. Instrumentation and Monitoring			
4.1 Concerns from Instrumentation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
5. Spillway, Discharge Structure, etc.			
5.1 Concern for Discharge Control Structure	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See below.
5.2 Concern for Adequacy & Reliability of Spillway without Human Intervention	<input type="checkbox"/>	<input type="checkbox"/>	N/A – No Spillway
6. Other Concerns			
Geobag discharge collection ditch requires additional rip rap erosion protection. Photo 60			
Eastern portion of seepage collection ditch must be completed to meet design requirements.			



DAM SAFETY INSPECTION CHECKLIST REPORT
2020 Dam Safety Inspection
TOUQUOY MINE TMF – POLISHING POND DAM

Project: Touquoy TMF Project			
Site Identification:	Touquoy Mine Site	Structure Identification:	Polishing Pond Dam
Location:	Middle Musquodoboit, NS		
Inspection Date:	June 11, 2020	Inspection Time:	1:00 to 4:00 PM
Inspected by:	Sean McOuat Dan McQuinn	Accompanied by:	N/A
Inspection Type:	DSI <input checked="" type="checkbox"/>	Special Event <input type="checkbox"/>	Routine <input type="checkbox"/> Sampling <input type="checkbox"/> Other <input type="checkbox"/>
Weather Conditions:	Inspection Day:	Overcast and showers	Temp.: +11 deg C
	Previous Week Avg.:	Variable	Temp. Range: 7 – 15 deg C
Date of Last DSI:	December 2019		
Structure Type:	Zoned earth fill dam	Spillway Details:	HDPE liner over crest followed by Rock lined channel
D/S Walk Over:	Yes	Spillway Invert Elev.	112.4 m
Exposed U/S Insp.:	Yes	Crest Elev.:	Approx 114.5 m
Discharge Fac. Insp.	Yes	Crest Width:	Approx 8.0 m
Pond Elev.:	111 m (estimated)	Max Height:	Approx 10.0 m
Current Freeboard:	3.5 m (estimated) to crest	Dam Length:	650 m

Issues since Last DSI None Reported

AMNS TMF Drone Image



DAM SAFETY INSPECTION CHECKLIST REPORT			
Structure Identification: Polishing Pond Dam			
Inspection Item	Concerns		Comments
	Y	N	
1. Dam Crest & Abutments			
1.1 Surface Cracking, Sinkholes, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.2 Excessive Differential Settlement	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.3 Lateral Movement	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.4 Erosion/Breaching/Washout	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.5 Liner Anchor Trench Movement	<input type="checkbox"/>	<input type="checkbox"/>	N/A
1.6 Visible Irregularities at Abutments	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.7 Undesirable Vegetation, Debris, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2. Upstream Slope			
2.1 Riprap Slope Benching, Ice Damage, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.2 Surface Erosion, Gullies, Slope Undercutting, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.3 Movement, Sloughing, Cracks, Irregularities, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.4 Exposed Liner Condition	<input type="checkbox"/>	<input type="checkbox"/>	N/A
2.5 Excessive Vegetation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.6 High Water Marks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.7 Other Unusual Conditions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Downstream Slope and Toe			
3.1 Surface Erosion (Gullies)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.2 Seepage, Wet Areas, Sand Boils, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.3 Signs of Movement, Cracks, Other Irregularities	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.4 Undesirable Vegetation Growth	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.5 Animal Burrows	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.6 Presence of Tailings Spills, Vegetation Kill, Ground Discoloration, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.7 Other Unusual Conditions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4. Instrumentation and Monitoring			
4.1 Concerns from Instrumentation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
5. Spillway, Discharge Structure, etc.			
5.1 Concern for Discharge Control Structure	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
5.2 Concern for Adequacy & Reliability of Spillway without Human Intervention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
6. Other Concerns			
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	





DAM SAFETY INSPECTION CHECKLIST REPORT			
2020 Dam Safety Inspection			
TOUQUOY MINE TMF - ENGINEERED WETLAND			
Project: Touquoy TMF Project			
Site Identification:	Touquoy Mine Site	Structure Identification:	Engineered Wetland
Location:	Middle Musquodoboit, NS		
Inspection Date:	June 11, 2020	Inspection Time:	1:00 to 4:00 PM
Inspected by:	Sean McOuat Dan McQuinn	Accompanied by:	N/A
Inspection Type:	DSI <input checked="" type="checkbox"/> Special Event <input type="checkbox"/> Routine <input type="checkbox"/> Sampling <input type="checkbox"/> Other <input type="checkbox"/>		
Weather Conditions:	Inspection Day:	Overcast with showers	Temp.: +11 deg C
	Previous Week Avg.:	Variable	Temp. Range: 7- 15 deg C
Date of Last DSI:	December 2019		
Structure Type:	Zoned earth fill dam	Spillway Details:	Rock lined channel
D/S Walk Over:	Yes	Spillway Invert Elev.	111.0 m
Exposed U/S Insp.:	Yes	Crest Elev.:	Approx 111.5 m
Discharge Fac. Insp.	Yes	Crest Width:	Approx 2.0 m
Pond Elev.:	110 m (estimated)	Max Height:	Approx 3.0 m
Current Freeboard:	1.5 m (estimated) to crest	Dam Length:	Approx 200 m
Issues since Last DSI	None Reported		



AMNS TMF Drone Image




DAM SAFETY INSPECTION CHECKLIST REPORT			
Structure Identification: Engineered Wetland			
Inspection Item	Concerns		Comments
	Y	N	
1. Dam Crest & Abutments			
1.1 Surface Cracking, Sinkholes, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.2 Excessive Differential Settlement	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.3 Lateral Movement	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.4 Erosion/Breaching/Washout	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.5 Liner Anchor Trench Movement	<input type="checkbox"/>	<input type="checkbox"/>	N/A
1.6 Visible Irregularities at Abutments	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.7 Undesirable Vegetation, Debris, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2. Upstream Slope			
2.1 Riprap Slope Benching, Ice Damage, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.2 Surface Erosion, Gullies, Slope Undercutting, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.3 Movement, Sloughing, Cracks, Irregularities, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.4 Exposed Liner Condition	<input type="checkbox"/>	<input type="checkbox"/>	N/A
2.5 Excessive Vegetation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.6 High Water Marks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.7 Other Unusual Conditions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Downstream Slope and Toe			
3.1 Surface Erosion (Gullies)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.2 Seepage, Wet Areas, Sand Boils, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.3 Signs of Movement, Cracks, Other Irregularities	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.4 Undesirable Vegetation Growth	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.5 Animal Burrows	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.6 Presence of Tailings Spills, Vegetation Kill, Ground Discoloration, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.7 Other Unusual Conditions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4. Instrumentation and Monitoring			
4.1 Concerns from Instrumentation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
5. Spillway, Discharge Structure, etc.			
5.1 Concern for Discharge Control Structure	<input checked="" type="checkbox"/>	<input type="checkbox"/>	There is a concentration of flow from the engineered wetland to the Scraggy Lake intake pumphouse which is causing some scour beneath the structure. The emergency spillway for the engineered wetland has evidently been disturbed from traffic and equipment. Grades and materials should be checked against design and repaired, as necessary.
5.2 Concern for Adequacy & Reliability of Spillway without Human Intervention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
6. Other Concerns			
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	






Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 1			
Photo Location: West Seepage Collection Ditch Near Station 0+550			
Image Date: 6/11/2020			
Photo Direction: North			
Comments: Showing bedrock excavated section			
File Name: IMG_3421.JPG			
Photograph ID: 2			
Photo Location: West Seepage Collection Ditch Near Station 0+550			
Image Date: 6/11/2020			
Photo Direction: South			
Comments: Bedrock excavated section			
File Name: IMG_3422.JPG			



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 3			
Photo Location: West Seepage Collection Ditch Near Station 0+550			
Image Date: 6/11/2020			
Photo Direction: East			
Comments: Location of toe seepage			
File Name: IMG_3423.JPG			
Photograph ID: 4			
Photo Location: West Seepage Collection Ditch Near Station 0+550			
Image Date: 6/11/2020			
Photo Direction: North			
Comments: Bedrock ridge remaining in seepage ditch to be removed to allow drainage.			
File Name: IMG_3424.JPG			



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS



Photograph ID: 5	
Photo Location: West Seepage Collection Ditch Near Station 0+550	
Image Date: 6/11/2020	
Photo Direction: South	
Comments: File Name: IMG_3425.JPG	



Photograph ID: 6	
Photo Location: Type 2 stockpile at crusher pad	
Image Date: 6/11/2020	
Photo Direction: N/A	
Comments: Material stockpiled from 2019. Ultimately failed due to high fines content. File Name: IMG_3426.JPG	



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 7			
Photo Location: Type 2 stockpile at crusher pad			
Image Date: 6/11/2020			
Photo Direction: N/A			
Comments: Greywacke rich area of failed stockpile.			
File Name: IMG_3427.JPG			
Photograph ID: 8			
Photo Location: Type 2 stockpile at crusher pad			
Image Date: 6/11/2020			
Photo Direction: West			
Comments: Material stockpiled from 2019. Ultimately failed due to high fines content. Shaded bands indicate argillite dark, greywacke light grey.			
File Name: IMG_3428.JPG			



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 9			
Photo Location: West Seepage Collection Ditch Near Station 0+800			
Image Date: 6/11/2020			
Photo Direction: East			
Comments: V notch weir installed to monitor seepage flow.			
File Name: IMG_3429.JPG			
Photograph ID: 10			
Photo Location: West Seepage Collection Ditch Near Station 0+800			
Image Date: 6/11/2020			
Photo Direction: East			
Comments: V notch weir installed to monitor seepage flow.			
File Name: IMG_3430.JPG			



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 11			
Photo Location: West Seepage Collection Ditch Near Station 0+800			
Image Date: 6/11/2020			
Photo Direction: East			
Comments: TMF Slope above V notch weir. Localized steepening.			
File Name: IMG_3431.JPG			
Photograph ID: 12			
Photo Location: West Seepage Collection Ditch Near Station 0+850			
Image Date: 6/11/2020			
Photo Direction: South			
Comments: First seepage collection pond.			
File Name: IMG_3432.JPG			



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 13			
Photo Location: West Seepage Collection Ditch Near Station 1+000			
Image Date: 6/11/2020			
Photo Direction: Southeast			
Comments: Second seepage collection pond			
File Name: IMG_3433.JPG			
Photograph ID: 14			
Photo Location: West Seepage Collection Ditch Near Station 1+000			
Image Date: 6/11/2020			
Photo Direction: East			
Comments: Second seepage collection pond			
File Name: IMG_3434.JPG			



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 15			
Photo Location: West Seepage Collection Ditch Near Station 1+000			
Image Date: 6/11/2020			
Photo Direction: South			
Comments: Second seepage collection pond			
File Name: IMG_3435.JPG			
Photograph ID: 16			
Photo Location: Southwest TMF approximately el. 125 m Near TMF Station 0+800			
Image Date: 6/11/2020			
Photo Direction: Southeast			
Comments: Upstream slope showing tailings beach			
File Name: IMG_3436.JPG			



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 17			
Photo Location: Southwest TMF approximately el. 125 m Near TMF Station 0+800			
Image Date: 6/11/2020			
Photo Direction: North			
Comments: Upstream slope showing tailings beach; end of tailings pipe.			
File Name: IMG_3437.JPG			
Photograph ID: 18			
Photo Location: Southwest TMF approximately el. 125 m Near TMF Station 0+800			
Image Date: 6/11/2020			
Photo Direction: North			
Comments: Type 3 Coarse Filter in place and approved.			
File Name: IMG_3438.JPG			



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 19			
Photo Location: Southwest TMF approximately el. 125 m Near TMF Station 0+800			
Image Date: 6/11/2020			
Photo Direction: Northwest			
Comments: Type 3 Coarse Filter in place and approved.			
File Name: IMG_3439.JPG			
Photograph ID: 20			
Photo Location: Southwest TMF approximately el. 125 m Near TMF Station 0+750			
Image Date: 6/11/2020			
Photo Direction: Northeast			
Comments: Piezometer station in clay core.			
File Name: IMG_3440.JPG			

Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 21			
Photo Location: Southwest TMF approximately el. 125 m Near TMF Station 0+750			
Image Date: 6/11/2020			
Photo Direction: North			
Comments: Tailings beach.			
File Name: IMG_3441.JPG			
Photograph ID: 22			
Photo Location: Southwest TMF approximately el. 125 m Near TMF Station 0+750			
Image Date: 6/11/2020			
Photo Direction: North			
Comments: Tailings beach.			
File Name: IMG_3442.JPG			


Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 23			
Photo Location: Southwest TMF el. 125 m to 128 Near TMF Station 0+500			
Image Date: 7/28/2020			
Photo Direction:			
Comments: Placing and compacting Type 2 fine filter over Type 3			
File Name: IMG_0133.JPG			
Photograph ID: 24			
Photo Location: Northwest TMF near TMF Station 0+100			
Image Date: 6/11/2020			
Photo Direction: North			
Comments: Pit water discharge location. Contaminated waste stockpile at right.			
File Name: IMG_3444.JPG			

Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 25			
Photo Location: Northwest TMF near TMF Station 0+100			
Image Date: 6/11/2020			
Photo Direction: Southeast			
Comments: Pit water discharge location. Contaminated waste stockpile at left.			
File Name: IMG_3445.JPG			
Photograph ID: 26			
Photo Location: Northwest TMF near Station 0+100			
Image Date: 6/11/2020			
Photo Direction: South			
Comments: Tailings discharge pipe			
File Name: IMG_3446.JPG			



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 27			
Photo Location: North TMF near Station 2+950			
Image Date: 6/11/2020			
Photo Direction: West			
Comments: Thin tailings over high ground. Approximately el. 123.5 m.			
File Name: IMG_3447.JPG			
Photograph ID: 28			
Photo Location: North TMF near Station 2+950			
Image Date: 6/11/2020			
Photo Direction: West			
Comments: Thin tailings over high ground. Approximately el. 123.5 m.			
File Name: IMG_3448.JPG			



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 29			
Photo Location: North TMF near Station 2+950			
Image Date: 6/11/2020			
Photo Direction: Northwest			
Comments: Vehicles at approximately el. 125.0 m; tailings at approximately el. 123.5 m			
File Name: IMG_3449.JPG			
Photograph ID: 30			
Photo Location: North TMF near Station 2+950			
Image Date: 6/11/2020			
Photo Direction: East			
Comments: Upstream near natural ground elevation.			
File Name: IMG_3450.JPG			

Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS

Photograph ID: 31	
Photo Location: North TMF near Station 2+950	
Image Date: 6/11/2020	
Photo Direction: East	
Comments: Depression on bedrock outcrop near core filter location. to be filled with clay.	
File Name: IMG_3451.JPG	


Photograph ID: 32	
Photo Location: Northeast Seepage Collection Ditch near Station 0+300	
Image Date: 7/28/2020	
Photo Direction: East	
Comments: Collection ditch under construction	
File Name: IMG_0125.JPG	



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 33			
Photo Location: Northeast Seepage Collection Pond near Station 0+300			
Image Date: 7/28/2020			
Photo Direction: Northwest			
Comments: Pond location before construction			
File Name: IMG_0126.JPG			
Photograph ID: 34			
Photo Location: East TMF near Station 2+300 Downstream Slope			
Image Date: 7/28/2020			
Photo Direction: South			
Comments: Indicating irregular slope surface.			
File Name: IMG_0144.JPG			



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 35			
Photo Location: East TMF near Station 2+300 Downstream Slope			
Image Date: 7/28/2020			
Photo Direction: North			
Comments: Indicating irregular slope surface.			
File Name: IMG_0146.JPG			
Photograph ID: 36			
Photo Location: East TMF near Station Downstream Slope			
Image Date: 7/9/2020			
Photo Direction: South			
Comments: Indicating irregular slope surface.			
File Name: IMG_3826.JPG			



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS



Photograph ID: 37	
Photo Location: East TMF Upstream Slope Near Station	
Image Date: 7/2/2020	
Photo Direction: South	
Comments: Placing Type 10 on clay core	
File Name: IMG_3775.JPG	



Photograph ID: 38	
Photo Location: East Seepage Collection Ditch Near Station 0+250	
Image Date: 6/11/2020	
Photo Direction: Southeast	
Comments:	
File Name: IMG_3452.JPG	



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 39			
Photo Location: East Seepage Collection Ditch Near Station 0+310			
Image Date: 6/11/2020			
Photo Direction: Northwest			
Comments: First seepage pond on east collection ditch.			
File Name: IMG_3453.JPG			
Photograph ID: 40			
Photo Location: East Seepage Collection Ditch Near Station 0+370			
Image Date: 6/11/2020			
Photo Direction: West			
Comments: Piezometer monitoring station.			
File Name: IMG_3454.JPG			



Client: Atlantic Mining NS Corp Site Name: Touquoy Mine Site	Project: Spring 2020 Touquoy TMF DSI Site Location: Middle Musquodoboit, NS
<p>Photograph ID: 41</p> <p>Photo Location: East Seepage Collection Ditch Near Station 0+310</p> <p>Image Date: 6/11/2020</p> <p>Photo Direction: North</p> <p>Comments: First seepage pond on east collection ditch.</p> <p>File Name: IMG_3455.JPG</p>	 <p>A photograph showing a small, shallow, brownish seepage pond situated on a steep, rocky slope. The slope is covered in grey and brown rocks of various sizes. The sky is overcast and grey.</p>
<p>Photograph ID: 42</p> <p>Photo Location: East Seepage Collection Ditch Near Station 0+450</p> <p>Image Date: 6/11/2020</p> <p>Photo Direction: North</p> <p>Comments: Poorly drained section of east seepage collection ditch.</p> <p>File Name: IMG_3456.JPG</p>	 <p>A photograph showing a section of a seepage collection ditch. The ditch is filled with a thick, reddish-brown slurry, indicating poor drainage. The ditch is bordered by a steep, rocky slope on the left and a gravelly area on the right. The sky is overcast.</p>

Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 43			
Photo Location: East Seepage Collection Ditch Near Station 0+600			
Image Date: 6/11/2020			
Photo Direction: South			
Comments: Seepage Collection Pond			
File Name: IMG_3457.JPG			
Photograph ID: 44			
Photo Location: East Side Polishing Pond			
Image Date: 6/11/2020			
Photo Direction: Southwest			
Comments:			
File Name: IMG_3458.JPG			



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 45			
Photo Location: Polishing Pond Dam Near East Corner Perimeter Road			
Image Date: 6/11/2020			
Photo Direction: South			
Comments: Piezometer Monitoring Station in clay core.			
File Name: IMG_3459.JPG			
Photograph ID: 46			
Photo Location: Polishing Pond Control Weir West End of Engineered Wetland			
Image Date: 6/11/2020			
Photo Direction: West			
Comments: Broad crested weir with additional flow-meter instrumentation installed.			
File Name: IMG_3460.JPG			



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 47			
Photo Location: Access Road East of Engineered Wetland			
Image Date: 6/11/2020			
Photo Direction: East			
Comments: Ponded water downstream of wetland due to tracked vehicle ruts.			
File Name: IMG_3461.JPG			
Photograph ID: 48			
Photo Location: Engineered Wetland Centre Area			
Image Date: 6/11/2020			
Photo Direction: Northwest			
Comments: Wetland vegetation.			
File Name: IMG_3462.JPG			



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 49			
Photo Location: Engineered Wetland Centre Area			
Image Date: 6/11/2020			
Photo Direction: West			
Comments: Repaired slope, north side of wetland			
File Name: IMG_3463.JPG			
Photograph ID: 50			
Photo Location: Engineered Wetland West End			
Image Date: 6/11/2020			
Photo Direction: West			
Comments: Disturbed spillway area			
File Name: IMG_3464.JPG			



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 51			
Photo Location:			
Engineered Wetland West End			
Image Date:			
6/11/2020			
Photo Direction:			
West			
Comments:			
Disturbed spillway area			
File Name:			
IMG_3465.JPG			
Photograph ID: 52			
Photo Location:			
Engineered Wetland West End			
Image Date:			
6/11/2020			
Photo Direction:			
East			
Comments:			
Disturbed spillway area			
File Name:			
IMG_3466.JPG			



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 53			
Photo Location: Access to Scraggy Lake Freshwater Intake Pump House			
Image Date: 6/11/2020			
Photo Direction: East			
Comments: Sheet flow from Engineered Wetland.			
File Name: IMG_3467.JPG			
Photograph ID: 54			
Photo Location: Access to Scraggy Lake Freshwater Intake Pump House			
Image Date: 6/11/2020			
Photo Direction: West			
Comments: Ponded water adjacent to Scraggy Lake Pump House			
File Name: IMG_3468.JPG			

Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 55			
Photo Location: Access to Scraggy Lake Freshwater Intake Pump House			
Image Date: 6/11/2020			
Photo Direction: North			
Comments: Ponded water undermining Scraggy Lake Pump House			
File Name: IMG_3469.JPG			
Photograph ID: 56			
Photo Location: Engineered Wetland West End			
Image Date: 6/11/2020			
Photo Direction: Northeast			
Comments:			
File Name: IMG_3470.JPG			



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 57			
Photo Location: Geobag Area Panoramic			
Image Date: 7/20/2020			
Photo Direction: East			
Comments: ETP on shutdown			
File Name: IMG_3890.JPG			
Photograph ID: 58			
Photo Location: Geobag Area			
Image Date: 6/11/2020			
Photo Direction: Northwest			
Comments: Geobag 4 outflow			
File Name: IMG_3471.JPG			



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 59			
Photo Location: Geobag Area			
Image Date: 6/11/2020			
Photo Direction: Northeast			
Comments: Repaired washout area entering polishing pond.			
File Name: IMG_3472.JPG			
Photograph ID: 60			
Photo Location: Geobag Area			
Image Date: 6/11/2020			
Photo Direction: North			
Comments: Geobag collection ditch. Area showing downstream berm erosion to be repaired			
File Name: IMG_3473.JPG			



Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 61			
Photo Location: Geobag Area			
Image Date: 6/11/2020			
Photo Direction: West			
Comments: Sheet flow exiting geobags.			
File Name: IMG_3474.JPG			
Photograph ID: 62			
Photo Location: Geobag Area			
Image Date: 6/11/2020			
Photo Direction: Southwest			
Comments: Geobag #1 showing geotextile and previously damaged geobag underneath			
File Name: IMG_3475.JPG			

Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 63			
Photo Location: Geobag Area			
Image Date: 6/11/2020			
Photo Direction: West			
Comments: Geobag #2 and #3 flow into collection ditch			
File Name: IMG_3476.JPG			
Photograph ID: 64			
Photo Location: Geobag Area			
Image Date: 6/11/2020			
Photo Direction: Northwest			
Comments: West end of collection ditch.			
File Name: IMG_3477.JPG			

Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS

<p>Photograph ID: 65</p> <p>Photo Location: Geobag area outflow/Polishing Pond</p> <p>Image Date: 6/11/2020</p> <p>Photo Direction: Northeast</p> <p>Comments: Geobag outflow into west-end of polishing pond. Brown silt deposit on pond bottom.</p> <p>File Name: IMG_3478.JPG</p>	
<p>Photograph ID: 66</p> <p>Photo Location: Geobag spillway area.</p> <p>Image Date: 6/11/2020</p> <p>Photo Direction: Southwest</p> <p>Comments: Terminus of repaired spillway showing larger rock placed erosion mitigation</p> <p>File Name: IMG_3479.JPG</p>	

Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 67			
Photo Location: Tailings Pipe South West Slope			
Image Date: 7/28/2020			
Photo Direction: Southeast			
Comments:			
File Name: IMG_0130.JPG			
Photograph ID: 68			
Photo Location: Tailings Pipe South West Slope			
Image Date: 7/28/2020			
Photo Direction: Northwest			
Comments: Indicates periodic holes for spigotting.			
File Name: IMG_0135crop.jpg			

Client:	Atlantic Mining NS Corp	Project:	Spring 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 69			
Photo Location: Tailings Pipe South West Slope			
Image Date: 7/28/2020			
Photo Direction: North			
Comments: End of tailings pipe			
File Name: IMG_0134.JPG			
Photograph ID: 70			
Photo Location: South TMF Pond			
Image Date: 7/28/2020			
Photo Direction: East			
Comments: Tailings pond decant barge.			
File Name: IMG_0141.JPG			



**Fall 2020 Dam Safety Inspection,
Touquoy Mine TMF**

February 24, 2021

Prepared for:

Atlantic Mining Nova Scotia Inc.
Moose River Gold Mine
6749 Moose River Rd,
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Prepared by:

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FALL 2020 DAM SAFETY INSPECTION, TOUQUOY MINE TMF

Introduction
February 24, 2021

1.0 INTRODUCTION

Atlantic Mining Nova Scotia Inc. (AMNS) has retained Stantec Consulting Ltd. (Stantec) to conduct a Dam Safety Inspection (DSI) of the Touquoy Tailings Management Facility (TMF) located at the Touquoy Gold Mine, Middle Musquodoboit, NS. The following structures were inspected as per the scope of work:

- Tailings Pond Dam
- Polishing Pond Dam
- Engineered Wetland Dam

The DSI site inspections of the structures were conducted by Sylvia Bryson, MScE., P.Eng. and Sean McOuat, BSc. of Stantec and Ryan Keating, TMF Engineer in Training of AMNS, on December 7, 2020.

In general, the DSI was completed in accordance with Section 3.6.2 of the Canadian Dam Association (CDA) Guidelines; subsection “Engineering Inspections”. CDA notes that an engineering inspection is limited to a visual examination of the dam and the instrumentation used to monitor the dam performance. The inspection documents observations regarding the condition of the dam and highlights any “significant” changes from the previous inspections.

As per Industrial Approval (IA) 2012-08244-08, dated November 4, 2020, a DSI is to be completed twice per year at the site. This report represents the second DSI completed in 2020.

Use of this report is subject to the Statement of Report Limitations General Conditions in Appendix A.

2.0 APPLICABLE GUIDELINES AND BEST MANAGEMENT PRACTICES

In Nova Scotia, guidelines, and best management practices for Dam Safety Inspections (DSIs) comprise:

- Canadian Dam Association (CDA)
 - 2007 Dam Safety Guidelines, as revised in 2013.
 - 2014 Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams and 2016 Update.
 - Other relevant CDA Technical Bulletins.
- Mining Association of Canada (MAC)
 - A Guide to the Management of Tailings Facilities, Version 3.1 (2019)
 - Developing an Operation, Maintenance, and Surveillance Manual for Tailings and Water Management Facilities, Second Edition, (2019)



FALL 2020 DAM SAFETY INSPECTION, TOUQUOY MINE TMF

Site Description and Background

February 24, 2021

3.0 SITE DESCRIPTION AND BACKGROUND

3.1 GENERAL

The Touquoy Mine, owned and operated by AMNS, is an open pit gold mine with milling capabilities. The mine is located approximately 100 kilometers (km) northeast of Halifax in the Moose River Gold Mines District in Halifax County, Nova Scotia, Canada. The site is accessible by vehicle access road. The general site Plan is shown below in Figure 1.

3.2 TMF DESCRIPTION

The Touquoy TMF is situated in the south-east area of the Touquoy Gold Project, south of the mill and waste rock storage facility. The project development is comprised of a mill, tailings pipelines, tailings pond, polishing pond, an engineered wetland, and associated facilities described herein.

The tailings are processed in the onsite mill. The tailings are transported from the mill to the tailings pond in a double walled HDPE pipeline within a secondary containment ditch. Reclaim water for the mill is made up of water from the tailings pond and water from Scraggy Lake. Discharge from the tailings pond is treated at an Effluent Treatment Plant (ETP) which provides metals removal, solids removal and pH control. From the ETP, water is directed to geobags which provide additional solids and metal capture prior to release to the polishing pond. The Polishing Pond has a dam constructed with an upstream sloping clay till core, waste rock shell, and associated filters, is located downstream of the tailings pond and provides additional water retention time. Discharge of treated effluent from the polishing pond is controlled via the final discharge point (FDP) control structure. Effluent is discharged to an engineered wetland downstream of the polishing pond which provides a final polishing step prior to release to the natural environment (Scraggy Lake).

The tailings pond is enclosed by an approximately 3,400 meters long tailings dam. The dam is being constructed using the downstream raise method, with an upstream sloping clay till core, waste rock shell, associated filters, and slope protection. The tailings pond manages the runoff from the contributing TMF catchment, tailings discharge slurry, seepage collection ditches, historical tailings and the water retained in the tailings' voids. Runoff from the mill site, open pit, and waste rock storage facility also discharges to the TMF. Seepage collection ditches along the east, west, and recently completed, along the north edges of the TMF are designed to collect surface runoff and shallow seepage and pump it back into the tailings pond.



FALL 2020 DAM SAFETY INSPECTION, TOUQUOY MINE TMF

Site Description and Background
February 24, 2021

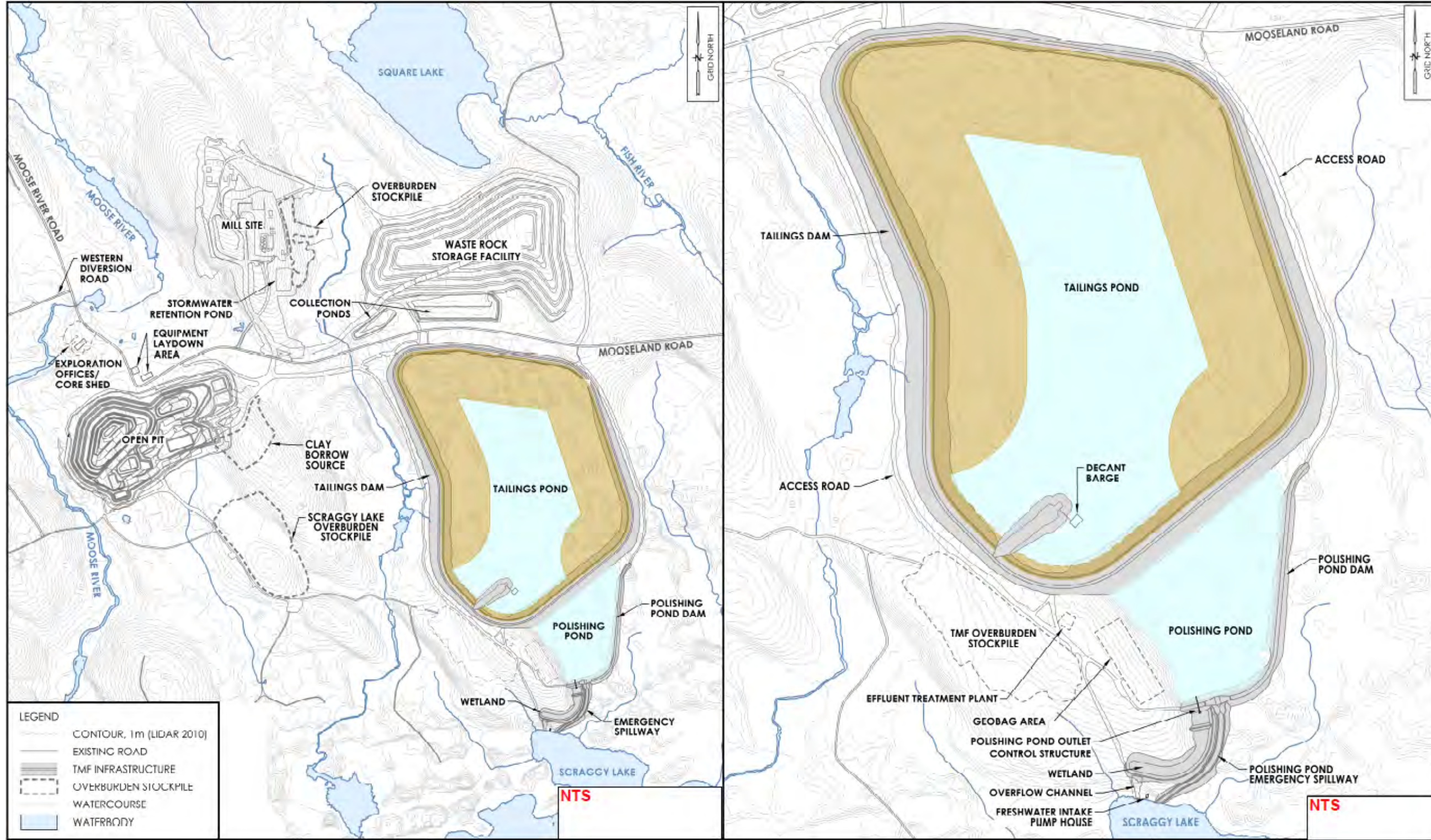


Figure 1. Site Plan (Stantec, 2020)

FALL 2020 DAM SAFETY INSPECTION, TOUQUOY MINE TMF

DSI Methodology and Observations

February 24, 2021

3.3 KEY OPERATING STRUCTURES

The TMF includes the following infrastructure that are closely related to the operation, maintenance, and surveillance of the TMF.

- Tailings Dam and Associated Structures
 - Water reclaim, tailings drainage, and seepage collection.
 - Tailings delivery and distribution system
 - Effluent treatment plant (ETP) and geobags
 - Instrumentation
- Polishing Pond Dam and Associated Structures
- Engineered Wetland and Associated Structures

3.4 PREVIOUS DAM SAFETY INSPECTIONS

The most recent DSIs are as follows:

- *Spring 2020 Dam Safety Inspection, Touquoy Mine TMF, Stantec Consulting Ltd.*
- *Fall 2019 Dam Safety Inspection, Touquoy Mine TMF, Stantec Consulting Ltd.*
- *Spring 2019 Dam Safety Inspection, Touquoy Mine TMF, Stantec Consulting Ltd.*
- *Fall 2018 Dam Safety Inspection, Touquoy Mine TMF, Stantec Consulting Ltd.*
- *Spring 2018 Dam Safety Inspection, Touquoy Mine TMF, Stantec Consulting Ltd.*

The most recent DSI, Spring 2020, was completed by Dan McQuinn, P.Eng. of Stantec. The previous DSIs were completed by Paul Deering, P.Eng., P.Geo. of Stantec.

4.0 DSI METHODOLOGY AND OBSERVATIONS

4.1 METHODOLOGY

The site inspection was conducted by Sean McOuat, BSc., and Sylvia Bryson, MScE., P. Eng. of Stantec on December 7, 2020. Stantec staff were accompanied by Ryan Keating of Atlantic Mining Nova Scotia Inc. The weather at the time of inspection was overcast with showers and flurries at 0°C.

At the time of the inspection, construction of the TMF is ongoing with fulltime inspection of the construction activities by Stantec and review by Mr. Deering as Engineer of Record (EOR). In addition to the information presented herein, additional daily photographs and records of construction activities are within Stantec's project files and have been issued to AMNS.

The DSI was completed in accordance with Section 3.6.2 of the Canadian Dam Association (CDA) Guidelines; subsection "Engineering Inspections".

The DSI involved a walk over reconnaissance survey of the dam with specific attention paid to the crest, downstream slopes and toe area, and the exposed portions of the upstream slopes. Detailed observations



FALL 2020 DAM SAFETY INSPECTION, TOUQUOY MINE TMF

DSI Methodology and Observations

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were made for any signs of cracking, settlement, erosion, movement, seepage, and other items such as vegetation growth and animal burrows. No subsurface investigations to examine the soil conditions for the structures were conducted at the time of the site inspection.

Although the previously mentioned key elements of operating the facility are listed above, for the purpose of this report, the DSI was broken into the following parts for the inspection and checklists.

- Tailings Dam and Associated Structures
 - Water reclaim, tailings drainage, and seepage collection.
 - Tailings delivery and distribution system
 - Effluent treatment plant and geobags
 - Instrumentation
- Polishing Pond Dam and Associated Structures
- Engineered Wetland and Associated Structures

4.2 SITE OBSERVATIONS

The results of the field observations are documented in the Dam Safety Inspection Checklist Reports and Photos (Appendix B) and summarized in the following subsections:

4.2.1 Tailings Storage Pond

Overall, the Tailings Pond dykes are in good condition with no signs that may be indicative of imminent safety concerns. Specific items noted at the time of the DSI are provided below and in the attached photographs 1 to 59.

- The dam was under construction at the time of the inspection, nearing completion of the raise from elevation (el). 125 m to el. 128 m.
- There was no evidence of overtopping.
- The water level in the tailings pond was below the max operational levels as per the Operations, Maintenance and Surveillance Manual (OMS) and the Emergency Preparedness and Response Plan (EPRP).
- There is no evidence of cloudy or muddy seepage from the pond.
- The downstream and upstream slopes were observed to be stable with no signs of slope instability.
- Some localized potholes and low spots on the perimeter access road near Station 1+025 allowing surface runoff to accumulate (Photograph 13). Localized regrading will be required to direct runoff towards the seepage collection ditch.
- A portion of the berm on the east side of the TMF perimeter access road was removed near Station 1+025 to prevent ponding of surface runoff and to direct runoff into the seepage collection ditch (Photographs 14 and 15)
- The downstream slope of the east TMF at some locations dam exhibit a slightly irregular slope surface not conforming to the design grades (Photograph 21). It is understood this is an as-built condition from placing removed frost cover on the downstream slope. While the cast-off rock fill does not affect the stability of the slope it is inconsistent with best practices.



FALL 2020 DAM SAFETY INSPECTION, TOUQUOY MINE TMF

DSI Methodology and Observations

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- The water in the East Pond 2 Seepage Collection Pond (Photograph 27) and seepage from a location at 2+000 (Photograph 30) was observed to be iron stained. Staining is of mineral nature and is not indicative of piping or internal erosion however this seepage warrants further investigation.
- Tailings deposition is ongoing on the east side of the tailings pond through spigotting. Boulders are placed at the discharge point to minimize potential for erosion. (Photographs 31 through 36).
- Piezometers are installed and data collected on a regular basis. It is noted that the current locations of several piezometers are only accessible by walking up or down the downstream slopes. These locations pose a health and safety risk for personnel who are taking measurements due to the very steep and uneven terrain, particularly during winter conditions. It is recommended that piezometer cables to be extended as required with dam construction so that measurements may be collected from a safer location.
- North seepage collection pond over capacity and flowing into the adjacent wetland (Photographs 47 to 49).
- Section of the north dam near Station 2+750 was overbuilt at the time of the site visit (Photograph 48). It is understood that overbuilt materials to be removed to the design geometry.

4.2.2 Geobag Area

While there are no dam structures at the geobag area, inspection of the water flow control ditches is completed during the DSI. Specific items noted at the time of the DSI are provided below and in the attached photographs 60 to 67.

- The ETP was operating at the time of inspection on December 7. (Photographs 60 through 65).
- Erosion at geobag discharge area noted during the June 2020 DSI was not repaired at the time of the site inspection. Following our site visit, this repair was completed on December 9, 2020 and was documented by Sean McOuat of Stantec who is on site to supervise the ongoing TMF construction (Photographs 66 and 67).

4.2.3 Polishing Pond

The Polishing Pond dam is in good condition with no signs that may be indicative of imminent safety concerns. Specific items noted at the time of the DSI are provided below and in the attached photographs 68 to 79.

- Some accumulation of timber debris within the pond near the discharge structure was noted. Removal of is recommended (Photographs 69)
- Emergency spillway is clear of obstructions.
- The irregular upstream slope of the polishing pond noted in the previous DSI are associated with the locations of the piezometers. (Photograph 76).



FALL 2020 DAM SAFETY INSPECTION, TOUQUOY MINE TMF

DSI Methodology and Observations

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4.2.4 Engineered Wetland

The Engineered Wetland Dam is in good condition with no signs that may be indicative of imminent safety concerns. Specific items noted at the time of the DSI are provided below and in the attached photographs 80 to 91.

- Vegetation is becoming established with in the engineered wetland (Photographs 81 through 83).
- There is a concentration of flow subsequently directed to the area of the Scraggy Lake intake pumphouse which is causing some scour beneath the structure (Photographs 87 and 91). This was noted during the Spring 2020 DSI but has not yet been addressed.
- Similar to the Spring 2020 DSI observations, the emergency spillway for the engineered wetland was partially filled for vehicle access to the Scraggy Lake Pumphouse building (Photo 89). Shortly following this recent DSI the spillway was repaired (Photograph 90).

4.3 REVIEW OF INSTRUMENTATION

Existing instrumentation consists of 30 vibrating wire piezometers (VWPs) installed within the TMF dam structure and 2 piezometers installed within the polishing pond dam. Data from the instrumentation is reviewed regularly to confirm that conditions are within the anticipated levels. The VWP data are regularly collected and submitted to the EOR for review. The latest memo prepared by Stantec (Doc No. MEM-176-900.300-A-12JAN21) on instrumentation and monitoring is provided in Appendix C.

With the exception of VWP Nos. 3, 10, 38, and 41, the data from the piezometers are within the anticipated levels as per the design. For VWP Nos. 3, 10, 38 and 41 we note the following:

- The equivalent hydraulic head (EHH) in VWP No. 3 and 10 installed in the clay core of TMF dam at Station 0+200 are higher than anticipated. These reading are considered suspect and further review and evaluation of this instrument and the calibration is required.
- VWP No. 38 is responding to water level changes in the tailings pond and therefore a direct hydrogeological connection with the pond water is possible. Continual monitoring of this piezometer is recommended with follow up water quality sampling immediately downstream in the Polishing Pond.
- VWP No. 41 installed within the clay core of the Polishing Pond is providing erratic data. A review and evaluation of this instrument is required and depending upon the findings, replacement of this instrument may be required.

In addition to the VWPs, a weir was installed in 2019 at an observed toe seepage location at approximately Station 0+300. Reading of the weir at the time of the inspection was 47 mm. It is understood that the weir level fluctuates seasonally and with precipitation events.



FALL 2020 DAM SAFETY INSPECTION, TOUQUOY MINE TMF

Conclusions and Recommendations

February 24, 2021

5.0 CONCLUSIONS AND RECOMMENDATIONS

The dam safety inspection carried out by Stantec did not note any evidence of crest settlement, slope instabilities or excessive seepage at the Touquoy tailings management facility and associated structures. Thus, the inspection did not find any significant issues concerning the overall safety of the Tailings Dam, Polishing Pond Dam, and Wetland Dam.

Based on Stantec's Fall 2020 DSI, recommendations have been provided in Table 5.1 below. The recommendations provided in Table 5.1 are based on the following criteria:

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

Table 5.1 2020 DSI Observations and Recommendations

No	Structure	Observation	Recommendation	Priority	Timeframe and/or Status Update
1	Tailings Pond Dam	Some localized potholes and low spots on the perimeter access road near Station 1+025 allowing surface runoff to accumulate.	Localized regrading will be required to direct runoff towards the seepage collection ditch.	2	2021
2	Tailings Pond Dam	The downstream slope of the east TMF dam exhibit a slightly irregular slope surface not conforming to the design grades at some locations. It is understood this is an as-built condition from placing removed frost cover on the downstream slope.	While the cast-off rock fill does not affect the stability of the slope it is inconsistent with best practices.	BMP ¹	Ongoing Activity
3	Tailings Pond Dam	The water in the East Pond 2 Seepage Collection Pond and seepage from a location at 2+000 was observed to be iron stained.	Staining is of mineral nature and is not indicative of piping or internal erosion however this seepage warrants further investigation.	3	Spring 2021



FALL 2020 DAM SAFETY INSPECTION, TOUQUOY MINE TMF

Conclusions and Recommendations

February 24, 2021

Table 5.1 2020 DSI Observations and Recommendations

No	Structure	Observation	Recommendation	Priority	Timeframe and/or Status Update
4	Tailings Pond Dam	Several piezometer cable leads are only accessible by walking up or down the downstream slopes. These locations pose a health and safety risk for personnel who are taking measurements due to the very steep and uneven terrain, particularly during winter conditions.	It is recommended that piezometer cables to be extended as required with dam construction so that measurements may be collected from a safer location.	2	Spring 2021
5	Geobag Area	Erosion at geobag discharge area noted during June 2020 DSI was not repaired at the time of the site inspection.	Following the DSI, this repair was completed on December 9, 2020 as documented by Sean McOuat of Stantec who is on site to supervise the ongoing TMF construction.	2	Work completed following DSI.
6	Polishing Pond Dam	Accumulation of wood debris along the upstream toe of the Polishing Pond dam.	Remove the wood debris, particularly around the intake structure.	3	Q1 2021
7	Wetland Dam	Similar to the Spring 2020 DSI observations, the emergency spillway for the engineered wetland was partially filled for vehicle access to the Scraggy Lake Pumphouse building.	Following the DSI, this repair was completed as documented by Sean McOuat of Stantec who is on site to supervise the ongoing TMF construction.	2	Work completed following DSI.
¹ BMP – Best Management Practice					



FALL 2020 DAM SAFETY INSPECTION, TOUQUOY MINE TMF

Closing Remarks
February 24, 2021

6.0 CLOSING REMARKS

Use of this report is subject to the Statement of Report Limitations General Conditions in Appendix A. It is the responsibility of Atlantic Mining NS Inc., who is identified as "the Client" within the Statement of Report Limitations General Conditions, and its agents to review the conditions and to notify Stantec should any of these not be satisfied.

The observations, comments, and recommendations included herein are based on the visual inspection of the Touquoy TMF carried out on December 7, 2020. This report is based on the observations of visible conditions of the structures, identified during the site visit and may not include conditions that became visible after the visit.

This report was prepared by Mark Palmer, P.Eng. and Sylvia Bryson, MScE., P.Eng., and reviewed by Paul Deering, P.Eng., P.Geo. Should you have any comments or clarifications regarding the above report, please do not hesitate to contact the undersigned at your convenience.

Yours Truly,

STANTEC CONSULTING LTD.



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A handwritten signature in blue ink that reads "P. Deering".

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FALL 2020 DAM SAFETY INSPECTION, TOUQUOY MINE TMF

References

February 24, 2021

7.0 REFERENCES

Canadian Dam Association. 2013. 2007 Dam Safety Guidelines (Revised, 2013)

Canadian Dam Association. 2014. Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams.

Canadian Dam Association. 2016. Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams (Update)

Mining Association of Canada. 2019. A Guide to the Management of Tailings Facilities, Version 3.1.

Mining Association of Canada. 2019. Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities, Second Edition.

Stantec Consulting Ltd. 2020. Touquoy TMF Operation, Maintenance, and Surveillance Manual, Revision 3, dated June 24, 2020.



APPENDIX A

Statement of Report Limitations and General Conditions

STATEMENT OF REPORT LIMITATIONS AND GENERAL CONDITIONS

This document entitled **Fall 2020 Dam Safety Inspection, Touquoy Mine TMF** was prepared by Stantec Consulting Ltd. (“Stantec”) for the account of Atlantic Mining Nova Scotia Inc (the “Client”).

USE OF THIS REPORT: This report has been prepared for the sole benefit of the Client and may not be used by any third party without the express written consent of Stantec. Any use which a third party makes of this report is the responsibility of such third party.

STANDARD OF CARE: Preparation of this report, and associated work, was carried out in accordance with the reasonable skill and diligence required by customarily accepted professional practices and procedures normally provided in the performance of such services at the time when and the location in which the services were performed. No other warranty is made.

RELIANCE ON DATA: In preparing this report, Stantec has utilized information and data obtained from the Client, or public and/or industry sources. Stantec has relied upon the information and data without independent verification, except only to the extent such verification was expressly included in the Services.

LIMITED SCOPE: The reported condition of the Tailings Storage Facility Pond, Polishing Pond and Engineered Wetland is based on observations of field conditions made under normal operating conditions and water levels at the time of inspection, along with data available to the inspection team. It is critical to note that the condition of these structures depends on numerous and constantly changing internal and external conditions and is evolutionary in nature. It would be incorrect to assume that the present condition of these structures will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Stantec disclaims any liability for any latent defects or deficiencies which are not reasonably discoverable under generally accepted industry standards or that should reasonably have been identified pursuant to other applicable inspection criteria. Any assessments of the facilities are limited in terms of accuracy to the time, scope, and purpose for which the assessment was prepared.

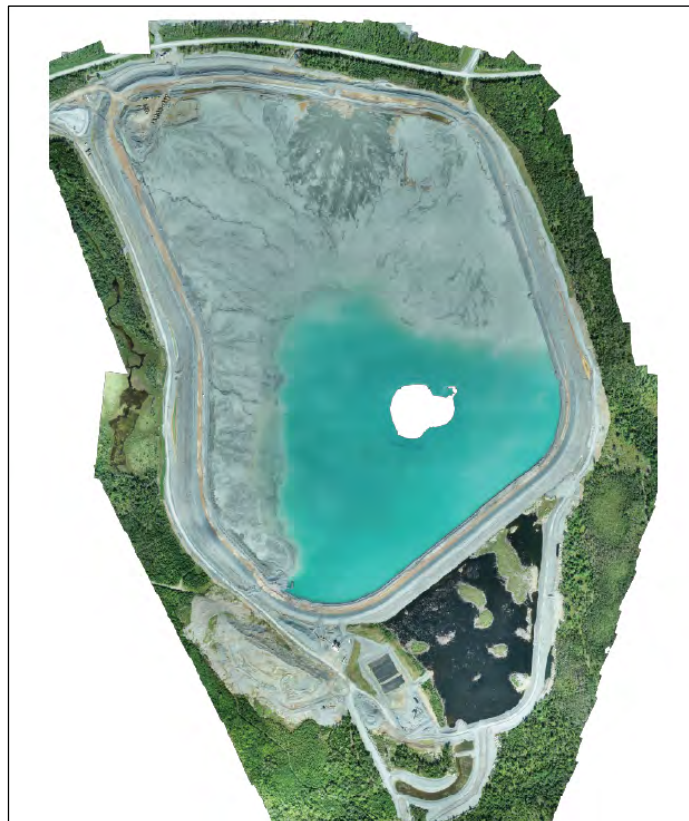
APPENDIX B

Dam Safety Inspection Checklist Reports and Site Photos

DAM SAFETY INSPECTION CHECKLIST REPORT
Fall 2020 Dam Safety Inspection
TOUQUOY MINE TMF – TAILINGS POND DAM AND ASSOCIATED STRUCTURES

Project: Touquoy Mine Project			
Site Identification:	Touquoy Mine Site	Structure Identification:	Tailings Pond Dam and Associated Structures
Location:	Middle Musquodoboit, NS		
Inspection Date:	December 7, 2020	Inspection Time:	1:00 to 4:30 PM
Inspected by:	Sean McOuat Sylvia Bryson	Accompanied by:	Ryan Keating (AMNS)
Inspection Type:	DSI <input checked="" type="checkbox"/> Special Event <input type="checkbox"/> Routine <input type="checkbox"/> Sampling <input type="checkbox"/> Other <input type="checkbox"/>		
Weather Conditions:	Inspection Day:	Overcast and showers	Temp.: 0 deg C
	Previous Week Avg.:	Overcast, rain over the weekend	Temp. Range: -4 to 17 deg C
Date of Last DSI:			
Structure Type:	Zoned earth fill dam	Spillway Details:	None
D/S Walk Over:	Yes	Spillway Invert Elev.	N/A
Exposed U/S Insp.:	Yes	Crest Elev.:	Approx 127.0 m to 128.0 m
Discharge Fac. Insp.	No	Crest Width:	Approx 15.0 m
Pond Elev.:	123.8 m (estimated)	Max Height:	Approx .19 m
Current Freeboard:	3.2 m (estimated)	Dam Length:	3,400 m
Issues since Last DSI	None Reported		

AMNS TMF Drone Image



DAM SAFETY INSPECTION CHECKLIST REPORT			
Structure Identification: Tailings Pond Dam and Associated Structures			
Inspection Item	Concerns		Comments
	Y	N	
1. Dam Crest & Abutments			
1.1 Surface Cracking, Sinkholes, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.2 Excessive Differential Settlement	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.3 Lateral Movement	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.4 Erosion/Breaching/Washout	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.5 Liner Anchor Trench Movement	<input type="checkbox"/>	<input type="checkbox"/>	N/A
1.6 Visible Irregularities at Abutments	<input type="checkbox"/>	<input type="checkbox"/>	N/A
1.7 Undesirable Vegetation, Debris, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2. Upstream Slope			
2.1 Riprap Slope Benching, Ice Damage, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.2 Surface Erosion, Gullies, Slope Undercutting, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.3 Movement, Sloughing, Cracks, Irregularities, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.4 Exposed Liner Condition	<input type="checkbox"/>	<input type="checkbox"/>	N/A
2.5 Excessive Vegetation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.6 High Water Marks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.7 Other Unusual Conditions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Downstream Slope and Toe			
3.1 Surface Erosion (Gullies)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.2 Seepage, Wet Areas, Sand Boils, etc.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Iron stained seepage at East Pond 2 Seepage Collection Pond. Ongoing, SM (Stantec) noted that the extent of staining is migrating north.
3.3 Signs of Movement, Cracks, Other Irregularities	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.4 Undesirable Vegetation Growth	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.5 Animal Burrows	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.6 Presence of Tailings Spills, Vegetation Kill, Ground Discoloration, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.7 Other Unusual Conditions	<input type="checkbox"/>	<input type="checkbox"/>	
4. Instrumentation and Monitoring			
4.1 Concerns from Instrumentation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Access to instrumentation cable leads is hazardous and presents a health and safety concern
5. Spillway, Discharge Structure, etc.			
5.1 Concern for Discharge Control Structure	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
5.2 Concern for Adequacy & Reliability of Spillway without Human Intervention	<input type="checkbox"/>	<input type="checkbox"/>	N/A – No Spillway
6. Other Concerns			
Water pooling in perimeter access road presents an environmental concern related to sediment release into adjacent water course.			



DAM SAFETY INSPECTION CHECKLIST REPORT			
Fall 2020 Dam Safety Inspection			
TOUQUOY MINE TMF – POLISHING POND DAM			
Project: Touquoy TMF Project			
Site Identification:	Touquoy Mine Site	Structure Identification:	Polishing Pond Dam
Location:	Middle Musquodoboit, NS		
Inspection Date:	December 7, 2020	Inspection Time:	1:00 to 4:30 PM
Inspected by:	Sean McOuat Sylvia Bryson	Accompanied by:	Ryan Keating (AMNS)
Inspection Type:	DSI <input checked="" type="checkbox"/> Special Event <input type="checkbox"/> Routine <input type="checkbox"/> Sampling <input type="checkbox"/> Other <input type="checkbox"/>		
Weather Conditions:	Inspection Day:	Overcast and showers	Temp.: 0 deg C
	Previous Week Avg.:	Overcast, rain over the weekend	Temp. Range: -4 to 17 deg C
Date of Last DSI:	June 11, 2020		
Structure Type:	Zoned earth fill dam	Spillway Details:	HDPE liner over crest followed by Rock lined channel
D/S Walk Over:	Yes	Spillway Invert Elev.	112.4 m
Exposed U/S Insp.:	Yes	Crest Elev.:	Approx 114.5 m
Discharge Fac. Insp.	Yes	Crest Width:	Approx 8.0 m
Pond Elev.:	110.6 m (estimated)	Max Height:	Approx 8.0 m
Current Freeboard:	3 m (estimated) to crest	Dam Length:	650 m
Issues since Last DSI	None Reported		

AMNS TMF Drone Image



DAM SAFETY INSPECTION CHECKLIST REPORT			
Structure Identification: Polishing Pond Dam			
Inspection Item	Concerns		Comments
	Y	N	
1. Dam Crest & Abutments			
1.1 Surface Cracking, Sinkholes, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.2 Excessive Differential Settlement	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.3 Lateral Movement	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.4 Erosion/Breaching/Washout	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.5 Liner Anchor Trench Movement	<input type="checkbox"/>	<input type="checkbox"/>	N/A
1.6 Visible Irregularities at Abutments	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.7 Undesirable Vegetation, Debris, etc.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Logs starting to accumulate at trash rack
2. Upstream Slope			
2.1 Riprap Slope Benching, Ice Damage, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.2 Surface Erosion, Gullies, Slope Undercutting, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.3 Movement, Sloughing, Cracks, Irregularities, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.4 Exposed Liner Condition	<input type="checkbox"/>	<input type="checkbox"/>	N/A
2.5 Excessive Vegetation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.6 High Water Marks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.7 Other Unusual Conditions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Downstream Slope and Toe			
3.1 Surface Erosion (Gullies)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.2 Seepage, Wet Areas, Sand Boils, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.3 Signs of Movement, Cracks, Other Irregularities	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.4 Undesirable Vegetation Growth	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.5 Animal Burrows	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.6 Presence of Tailings Spills, Vegetation Kill, Ground Discoloration, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.7 Other Unusual Conditions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4. Instrumentation and Monitoring			
4.1 Concerns from Instrumentation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
5. Spillway, Discharge Structure, etc.			
5.1 Concern for Discharge Control Structure	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
5.2 Concern for Adequacy & Reliability of Spillway without Human Intervention	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
6. Other Concerns			
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	



DAM SAFETY INSPECTION CHECKLIST REPORT
Fall 2020 Dam Safety Inspection
TOUQUOY MINE TMF - ENGINEERED WETLAND

Project: Touquoy TMF Project			
Site Identification:	Touquoy Mine Site	Structure Identification:	Engineered Wetland
Location:	Middle Musquodoboit, NS		
Inspection Date:	December 7, 2020	Inspection Time:	1:00 to 4:30 PM
Inspected by:	Sean McOuat Sylvia Bryson	Accompanied by:	Ryan Keating (AMNS)
Inspection Type:	DSI <input checked="" type="checkbox"/> Special Event <input type="checkbox"/> Routine <input type="checkbox"/> Sampling <input type="checkbox"/> Other <input type="checkbox"/>		
Weather Conditions:	Inspection Day:	Overcast and showers	Temp.: 0 deg C
	Previous Week Avg.:	Overcast, rain over the weekend	Temp. Range: -4 to 17 deg C
Date of Last DSI:	June 11, 2020		
Structure Type:	Zoned earth fill dam	Spillway Details:	Rock lined channel
D/S Walk Over:	Yes	Spillway Invert Elev.	111.0 m
Exposed U/S Insp.:	Yes	Crest Elev.:	Approx 111.5 m
Discharge Fac. Insp.	Yes	Crest Width:	Approx 2.0 m
Pond Elev.:	110.3 m (estimated)	Max Height:	Approx 3.0 m
Current Freeboard:	Approx. 1.2 m (estimated) to crest	Dam Length:	Approx 200 m
Issues since Last DSI	None Reported		

AMNS TMF Drone Image




DAM SAFETY INSPECTION CHECKLIST REPORT			
Structure Identification: Engineered Wetland			
Inspection Item	Concerns		Comments
	Y	N	
1. Dam Crest & Abutments			
1.1 Surface Cracking, Sinkholes, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.2 Excessive Differential Settlement	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.3 Lateral Movement	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.4 Erosion/Breaching/Washout	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.5 Liner Anchor Trench Movement	<input type="checkbox"/>	<input type="checkbox"/>	N/A
1.6 Visible Irregularities at Abutments	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.7 Undesirable Vegetation, Debris, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2. Upstream Slope			
2.1 Riprap Slope Benching, Ice Damage, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.2 Surface Erosion, Gullies, Slope Undercutting, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.3 Movement, Sloughing, Cracks, Irregularities, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.4 Exposed Liner Condition	<input type="checkbox"/>	<input type="checkbox"/>	N/A
2.5 Excessive Vegetation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.6 High Water Marks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.7 Other Unusual Conditions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Downstream Slope and Toe			
3.1 Surface Erosion (Gullies)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.2 Seepage, Wet Areas, Sand Boils, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.3 Signs of Movement, Cracks, Other Irregularities	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.4 Undesirable Vegetation Growth	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.5 Animal Burrows	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.6 Presence of Tailings Spills, Vegetation Kill, Ground Discoloration, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.7 Other Unusual Conditions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4. Instrumentation and Monitoring			
4.1 Concerns from Instrumentation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
5. Spillway, Discharge Structure, etc.			
5.1 Concern for Discharge Control Structure	<input checked="" type="checkbox"/>	<input type="checkbox"/>	There is a concentration of flow from the engineered wetland to the Scraggy Lake intake pumphouse which is causing some scour beneath the structure.
5.2 Concern for Adequacy & Reliability of Spillway without Human Intervention	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The emergency spillway for the engineered wetland was partially filled for vehicle access to the Scraggy Lake Pumphouse building. Shortly following this recent DSI the spillway was repaired.
6. Other Concerns			
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	



Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS

Photograph ID: 1	
Photo Location: TMF Pond/Dam.. West Seepage Collection Ditch Near Station 0+050	
Image Date: 12/7/2020	
Photo Direction: North	
Comments: TMF Pond/Dam Perimeter Seepage Collection Ditch	

Photograph ID: 2	
Photo Location: TMF Pond/Dam. West Seepage Collection Ditch Near Station 0+050	
Image Date: 12/7/2020	
Photo Direction: South	
Comments: TMF Pond/Dam Perimeter Seepage Collection Ditch. Bedrock excavated section	

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 3			
Photo Location: TMF Pond/Dam. West Seepage Collection Ditch Near Station 0+050			
Image Date: 12/7/2020			
Photo Direction: North			
Comments: TMF Pond/Dam Perimeter Seepage Collection Ditch. Bedrock ridge remaining in seepage ditch to be removed to allow drainage.			
Photograph ID: 4			
Photo Location: TMF Pond/Dam. West Seepage Collection Ditch Near Station 0+100			
Image Date: 12/7/2020			
Photo Direction: South			
Comments: Seepage collection ditch is clear of obstructions and functioning as designed.			

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS



Photograph ID: 5	
Photo Location: TMF Pond/Dam. West Seepage Collection Ditch Near Station 0+300	
Image Date: 12/7/2020	
Photo Direction: Northeast	
Comments: V notch weir installed to monitor seepage flow.	

Photograph ID: 6	
Photo Location: TMF Pond/Dam. West TMF Pond/Dam Seepage Collection Ditch	
Image Date: 12/7/2020	
Photo Direction: North	
Comments: Perimeter ditch clear of any debris and draining as intended. Downstream slopes of West TMF Pond/Dam are uniform, not showing any indications of deformation or instability.	

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS

Photograph ID: 7	
Photo Location: TMF Pond/Dam. West Seepage Collection Ditch Near Station 0+450	
Image Date: 12/7/2020	
Photo Direction: North	
Comments: West Pond 2 Seepage Collection Pond.	

Photograph ID: 8	
Photo Location: TMF Pond/Dam. West Seepage Collection Ditch Near Station 0+450	
Image Date: 12/7/2020	
Photo Direction: South	
Comments: Pipelines for pumping water from seepage collection ponds into the TMF Pond/Dam.	

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 9			
Photo Location: TMF. West TMF Perimeter Road Near Station 0+450			
Image Date: 12/7/2020			
Photo Direction: North			
Comments: Perimeter Road, pumping equipment for West Pond 3 on right.			
Photograph ID: 10			
Photo Location: TMF Pond/Dam. West Seepage Collection Ditch Near Station 0+550			
Image Date: 12/7/2020			
Photo Direction: South			
Comments: West Pond 3 Seepage Collection Pond.			

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS

Photograph ID: 11	
Photo Location: TMF Pond/Dam Perimeter Road Near Station 0+550	
Image Date: 12/7/2020	
Photo Direction: South	
Comments: Some potholes and low lying areas in perimeter road collecting water. Regrading required to direct runoff into the adjacent seepage collection ditch.	

Photograph ID: 12	
Photo Location: TMF Pond/Dam Perimeter Road Near Station 0+650	
Image Date: 12/7/2020	
Photo Direction: South	
Comments: Some potholes and low lying areas in perimeter road collecting water. Regrading required to direct runoff into the adjacent seepage collection ditch.	

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 13			
Photo Location: TMF Pond/Dam Perimeter Road Near Station 0+650			
Image Date: 12/7/2020			
Photo Direction: North			
Comments: Ponded water on the perimeter access road. Local regrading required.			
Photograph ID: 14			
Photo Location: TMF Pond/Dam Seepage Collection Ditch Near Station 0+650			
Image Date: 12/7/2020			
Photo Direction: East			
Comments: Break in perimeter access road berm to allow surface water to drain into the seepage collection ditch.			

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 15			
Photo Location: TMF Pond/Dam Seepage Collection Ditch Near Station 0+650			
Image Date: 12/7/2020			
Photo Direction: West			
Comments: Break in perimeter access road berm to allow surface water to drain into the seepage collection ditch.			
Photograph ID: 16			
Photo Location: West Seepage Collection Ditch Near Station 0+675			
Image Date: 12/7/2020			
Photo Direction: North			
Comments: West Pond 3 Seepage Collection Pond.			



Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 17			
Photo Location: West Seepage Collection Ditch Near Station 0+850			
Image Date: 12/7/2020			
Photo Direction: East			
Comments: Piezometer monitoring station.			
Photograph ID: 18			
Photo Location: TMF Pond/Dam West Seepage Collection Ditch Near Station 0+900			
Image Date: 12/7/2020			
Photo Direction: South			
Comments: Seepage collection clear of obstructions and draining as intended. Downstream slope does not show signs of deformation or instability.			

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 19			
Photo Location: TMF Pond/Dam Perimeter Road Near Station 0+950			
Image Date: 12/7/2020			
Photo Direction: Northwest			
Comments: Southern extent of the completed seepage collection ditch on the West TMF Pond/Dam. Various piping. Piezometer station.			
Photograph ID: 20			
Photo Location: TMF Pond/Dam. Seepage Collection Ditch Near Station 1+150			
Image Date: 12/7/2020			
Photo Direction: West			
Comments: Ponded runoff in seepage collection ditch. Stockpile of rejected filter material shown on left of photo.			

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 21			
Photo Location: TMF Pond/Dam. Toe of South TMF dam near east abutment of Polishing Pond.			
Image Date: 12/7/2020			
Photo Direction: East			
Comments: Downstream slope of dam.			
Photograph ID: 22			
Photo Location: East Seepage Ditch near Station 2+200			
Image Date: 12/7/2020			
Photo Direction: South			
Comments: East Seepage Ditch water iron stained near Station 2+200.			


Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 23			
Photo Location: TMF Pond/Dam. East Seepage Ditch near Station 1+800			
Image Date: 12/7/2020			
Photo Direction: Northeast			
Comments: East Pond 3 Seepage Collection Pond.			
Photograph ID: 24			
Photo Location: TMF Pond/Dam. East Seepage Ditch near Station 1+800			
Image Date: 12/7/2020			
Photo Direction: Southeast			
Comments: East Pond 3 Seepage Collection Pond.			



Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 25			
Photo Location: TMF Pond/Dam. East TMF Near Station 1+875			
Image Date: 12/7/2020			
Photo Direction: West			
Comments: Location of recent leak in pipe transporting seepage. Evidence of erosion where runoff was directed into seepage collection ditch. Leak had already been repaired at time of the site inspection.			
Photograph ID: 26			
Photo Location: TMF Pond/Dam. East Seepage Ditch near Station 1+900			
Image Date: 12/7/2020			
Photo Direction: Northeast			
Comments: Leaks in pipe have been recently repaired with bolts screwed into the HDPE. Understood that there is discussion of moving the pipe into the seepage collection ditch.			

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 27			
Photo Location: TMF Pond/Dam. East Seepage Ditch near Station 2+000			
Image Date: 12/7/2020			
Photo Direction: North			
Comments: East Pond 2 Seepage Collection Pond.			
Photograph ID: 28			
Photo Location: TMF Pond/Dam. East Seepage Ditch near Station 2+250			
Image Date: 12/7/2020			
Photo Direction: South			
Comments: East Seepage Ditch, with Piezometer Box on Downstream Slope			



Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS

Photograph ID: 29	
Photo Location: TMF Pond/Dam. East Seepage Ditch near Station 2+300	
Image Date: 12/7/2020	
Photo Direction: North	
Comments: East Pond 1 Seepage Collection Pond.	



Photograph ID: 30	
Photo Location: TMF Pond/Dam. East Seepage Ditch near Station 2+000	
Image Date: 12/7/2020	
Photo Direction: South	
Comments: East Seepage Ditch water iron stained near Station 2+000.	



Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 31			
Photo Location: TMF Pond/Dam. East TMF near Station 2+300, Tailings Pipe North East Slope			
Image Date: 12/7/2020			
Photo Direction: Northeast			
Comments: Tailings Beach.			
Photograph ID: 32			
Photo Location: TMF Pond/Dam. East TMF near Station 2+300			
Image Date: 12/7/2020			
Photo Direction:			
Comments: Formation of tailings beach.			



Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 33			
Photo Location: TMF Pond/Dam. Northeast TMF near Station 2+300			
Image Date: 12/7/2020			
Photo Direction: Northwest			
Comments: Tailings beach.			
Photograph ID: 34			
Photo Location: TMF Pond/Dam. East TMF near Station 2+300, Tailings Pipe North East Slope			
Image Date: 12/7/2020			
Photo Direction: Southeast			
Comments: Tailings discharge location.			



Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 35			
Photo Location: TMF Pond/Dam. Northeast TMF near Station 2+300			
Image Date: 12/7/2020			
Photo Direction: West			
Comments: Tailings beach.			
Photograph ID: 36			
Photo Location: TMF Pond/Dam. East TMF near Station 2+300, Tailings Pipe North East Slope			
Image Date: 12/7/2020			
Photo Direction: West			
Comments: End of pipe tailings discharge.			

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 37			
Photo Location: TMF Pond/Dam. East TMF near Station 2+250			
Image Date: 12/7/2020			
Photo Direction: South			
Comments: Downstream slope requiring Rockfill Protective Layer with East Seepage Ditch (under construction).			
Photograph ID: 38			
Photo Location: TMF Pond/Dam. East TMF near Station 2+250			
Image Date: 12/7/2020			
Photo Direction: North			
Comments: Downstream slope requiring Rockfill Protective Layer with East Seepage Ditch (under construction).			

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 39			
Photo Location: TMF Pond/Dam. Northeast TMF near Station 2+300			
Image Date: 12/7/2020			
Photo Direction: Southeast			
Comments: Tailings beach.			
Photograph ID: 40			
Photo Location: TMF Pond/Dam. Northeast TMF near Station 2+250			
Image Date: 12/7/2020			
Photo Direction: South			
Comments: Rutting on Dam surface on downstream side to be repaired.			

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 41			
Photo Location: TMF Pond/Dam. Southeast TMF near Station 2+100			
Image Date: 12/7/2020			
Photo Direction: North			
Comments: Seepage pipe pumping water into TMF from East Pond 2 Seepage Collection Pond			
Photograph ID: 42			
Photo Location: TMF Pond/Dam. Upstream Slope of East TMF near Station 2+050			
Image Date: 12/7/2020			
Photo Direction: South			
Comments: No evidence of erosion or instability on upstream slope.			



Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 43			
Photo Location: TMF Pond/Dam. Downstream Slope of East TMF near Station 2+050			
Image Date: 12/7/2020			
Photo Direction: South			
Comments: Downstream slope slightly irregular, as observed in Spring 2020 DSI. No indications of slope instability. Crest of dam incomplete at time of inspection (under construction)			
Photograph ID: 44			
Photo Location: TMF Pond/Dam. Southeast TMF near Station 1+850			
Image Date: 12/7/2020			
Photo Direction: Southwest			
Comments: Upstream Slope at Station 1+850			

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 45			
Photo Location: TMF Pond/Dam. Southeast TMF near Station 1+850			
Image Date: 12/7/2020			
Photo Direction: Northeast			
Comments: Upstream Slope at Station 1+850			
Photograph ID: 46			
Photo Location: TMF Pond/Dam. South TMF near Station 1+750			
Image Date: 12/7/2020			
Photo Direction: West			
Comments: Ongoing Construction of Type 1 Clay Core Placement on South TMF.			

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 47			
Photo Location: North Seepage Collection Pond near Station 2+750			
Image Date: 12/7/2020			
Photo Direction: West			
Comments: North Seepage Collection Pond at capacity. Rock hammering bedrock to remove high points visible in background.			
Photograph ID: 48			
Photo Location: North TMF Seepage Collection Pond near Station 2+750			
Image Date: 12/7/2020			
Photo Direction: East			
Comments: Downstream slopes under construction at time of inspection.			



Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 49			
Photo Location: TMF Pond/Dam. North Seepage Collection Pond			
Image Date: 12/7/2020			
Photo Direction: East			
Comments: North Seepage Collection Pond at capacity.			
Photograph ID: 50			
Photo Location: TMF Pond/Dam. North TMF Upstream Slope near Station 2+900			
Image Date: 12/7/2020			
Photo Direction: South			
Comments: Final shaping of slope to be completed. Tailing beach visible to the west			

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 51			
Photo Location: TMF Pond/Dam. Southwest TMF near Station 0+400			
Image Date: 12/7/2020			
Photo Direction: South			
Comments: Downstream Slope south north showing West Seepage Ditch.			
Photograph ID: 52			
Photo Location: TMF Pond/Dam. West TMF near Station 0+200			
Image Date: 12/7/2020			
Photo Direction: South			
Comments:			

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 53			
Photo Location: TMF Pond/Dam. Southwest TMF near Station 0+400			
Image Date: 12/7/2020			
Photo Direction: Northeast			
Comments: Piezometer station in clay core with Tailings Beach.			
Photograph ID: 54			
Photo Location: TMF Pond/Dam. Southwest TMF near Station 0+400			
Image Date: 12/7/2020			
Photo Direction: North			
Comments: Downstream Slope facing north showing West Seepage Ditch.			

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 55			
Photo Location:			
TMF Pond/Dam. Southwest TMF near Station 0+750			
Image Date:			
12/7/2020			
Photo Direction:			
North			
Comments:			
Ongoing Construction of Type 1 Clay Core Placement on Southwest TMF.			
Photograph ID: 56			
Photo Location:			
TMF Pond/Dam. Southwest TMF approximately el. 125 m Near TMF Station 0+800			
Image Date:			
6/11/2020			
Photo Direction:			
Southwest			
Comments:			
Piezometer station in clay core.			


Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 57			
Photo Location: TMF Pond/Dam. South TMF near Station 1+300			
Image Date: 12/7/2020			
Photo Direction: North			
Comments: Damaged Type 1 Clay Core and Type 2 Fine Filter to be repaired. as part of ongoing construction of TMF.			
Photograph ID: 58			
Photo Location: TMF Pond/Dam. South TMF near Station 1+400			
Image Date: 12/7/2020			
Photo Direction: East			
Comments: Ongoing construction of Type 1 Clay Core Placement on Type 2 Fine Filter slope.			

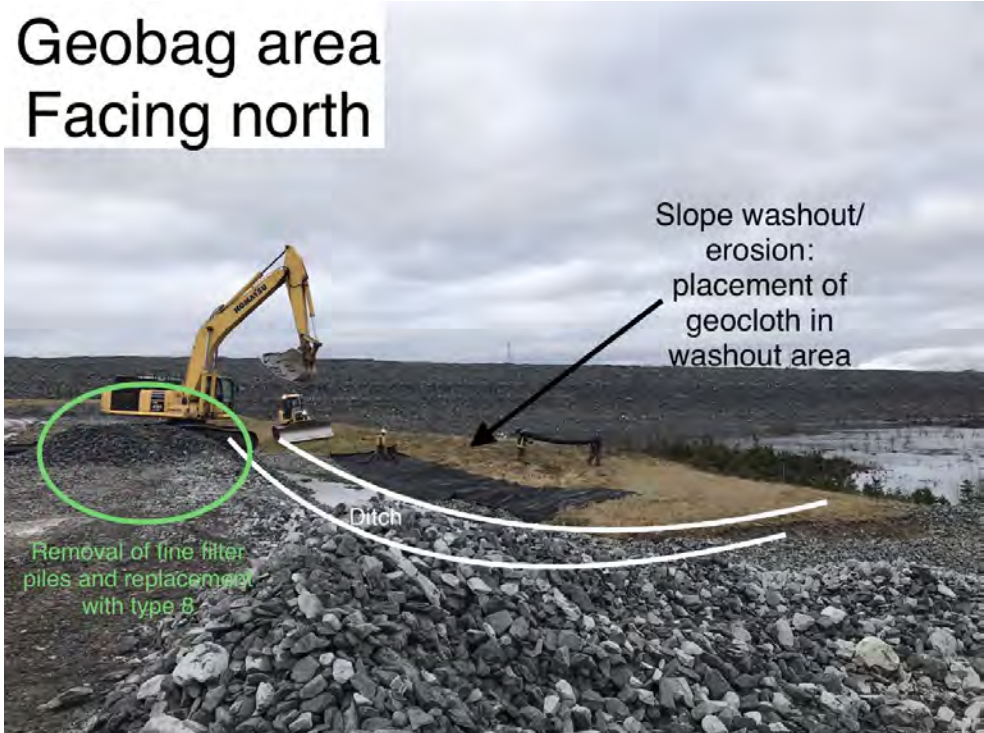
Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 59			
Photo Location: TMF Pond/Dam. South TMF Pond			
Image Date: 12/7/2020			
Photo Direction: East			
Comments: Tailings pond decant barge.			
Photograph ID: 60			
Photo Location: Geobag Area			
Image Date: 12/7/2020			
Photo Direction: South			
Comments: Overview of geobags used to filter water before discharge into polishing pond.			



Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 61			
Photo Location: Geobag Area			
Image Date: 12/7/2020			
Photo Direction: South			
Comments: Geobag collection ditch. Area showing downstream berm erosion to be repaired			
Photograph ID: 62			
Photo Location: Geobag Area			
Image Date: 12/7/2020			
Photo Direction: South			
Comments: Sheet flow exiting geobags.			



Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 63			
Photo Location: Geobag Area			
Image Date: 12/7/2020			
Photo Direction: Northwest			
Comments: Geobag 4 outflow.			
Photograph ID: 64			
Photo Location: Geobag Area			
Image Date: 12/7/2020			
Photo Direction: Northeast			
Comments: Repaired washout area entering Polishing Pond.			


Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS

Photograph ID: 65	
Photo Location: Geobag Area	
Image Date: 12/7/2020	
Photo Direction: Northwest	
Comments: Geobag collection ditch. Area showing downstream berm erosion to be repaired.	



Photograph ID: 66	
Photo Location: Geobag Area	
Image Date: 12/9/2020	
Photo Direction: North	
Comments: Previously eroded section of channel at the geobag discharge was repaired by placing a geotextile separator on the underlying soil and covering with rip rap. (Photo provided by S.McQuat, Stantec)	


Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI	
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS	
Photograph ID: 67				
Photo Location:				Geobag Area
Image Date:				12/9/2020
Photo Direction:				Northeast
Comments:				Completed repairs of previously eroded section of the geobag discharge channel. (Photo provided by S.McQuat, Stantec)
Photograph ID: 68				
Photo Location:				Polishing Pond
Image Date:				12/7/2020
Photo Direction:				North
Comments:				Polishing Pond



Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 69			
Photo Location: Polishing Pond			
Image Date: 12/7/2020			
Photo Direction: North			
Comments: Some accumulation of debris near the intake.			
Photograph ID: 70			
Photo Location: Polishing Pond			
Image Date: 12/7/2020			
Photo Direction: North			
Comments: Polishing Pond Outlet Control Structure			

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI	
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS	
Photograph ID: 71				
Photo Location:				Polishing Pond
Image Date:				12/7/2020
Photo Direction:				South
Comments:				The water trigger level of 111.5 m marked on the shoreline.
Photograph ID: 72				
Photo Location:				Polishing Pond
Image Date:				12/7/2020
Photo Direction:				East
Comments:				Perimeter Road around Polishing Pond



Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 73			
Photo Location: Polishing Pond			
Image Date: 12/7/2020			
Photo Direction: Southwest			
Comments: Terminus of repaired spillway showing larger rock placed erosion mitigation. Spillway is clear of obstructions.			
Photograph ID: 74			
Photo Location: Polishing Pond			
Image Date: 12/7/2020			
Photo Direction: South			
Comments: Seepage between Engineered Wetland and Emergency Spillway			



Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 75			
Photo Location: Polishing Pond			
Image Date: 12/7/2020			
Photo Direction: Northeast			
Comments: Seepage between Engineered Wetland and Polishing Pond Emergency Spillway			
Photograph ID: 76			
Photo Location: Polishing Pond			
Image Date: 12/7/2020			
Photo Direction: Southwest			
Comments: Upstream slope of Polishing Pond bump out. Timber debris noted at toe of slope.			



Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 77			
Photo Location: Polishing Pond			
Image Date: 12/7/2020			
Photo Direction: Northeast			
Comments: Timber debris accumulating. To be removed.			
Photograph ID: 78			
Photo Location: Polishing Pond			
Image Date: 12/7/2020			
Photo Direction: North			
Comments: Water accumulating at the toe of the downstream slope. Station 0+250			

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 79			
Photo Location: Polishing Pond			
Image Date: 12/7/2020			
Photo Direction: Southwest			
Comments: Timber debris accumulating. To be removed.			
Photograph ID: 80			
Photo Location: Engineered Wetland			
Image Date: 12/7/2020			
Photo Direction: East			
Comments: Repaired slope, north side of wetland.			

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 81			
Photo Location: Engineered Wetland			
Image Date: 12/7/2020			
Photo Direction: West			
Comments: Repaired slope, north side of wetland			
Photograph ID: 82			
Photo Location: Engineered Wetland			
Image Date: 12/7/2020			
Photo Direction: Northwest			
Comments: Wetland vegetation.			


Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 83			
Photo Location: Engineered Wetland			
Image Date: 12/7/2020			
Photo Direction: Northeast			
Comments: Vegetation within the Engineered Wetland			
Photograph ID: 84			
Photo Location: Engineered Wetland			
Image Date: 12/7/2020			
Photo Direction: West			
Comments: Outflow structure from Polishing Pond into Wetland. Broad crested weir with additional flow-meter instrumentation installed.			

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 85			
Photo Location: Engineered Wetland			
Image Date: 12/7/2020			
Photo Direction: South			
Comments: East end of Engineered Wetland.			
Photograph ID: 86			
Photo Location: Engineered Wetland			
Image Date: 12/7/2020			
Photo Direction: East			
Comments: Sheet flow visible seeping through Engineered Wetland berm into the wooded area to the south.			

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS
Photograph ID: 87			
Photo Location: Engineered Wetland			
Image Date: 12/7/2020			
Photo Direction: East			
Comments: Access to Scraggy Lake Freshwater Intake Pump House. Sheet flow from Engineered Wetland.			
Photograph ID: 88			
Photo Location: Engineered Wetland			
Image Date: 12/7/2020			
Photo Direction: South			
Comments: Emergency Spillway leading to Scraggy Lake.			

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS

Photograph ID: 89	
Photo Location: Engineered Wetland	
Image Date: 12/7/2020	
Photo Direction: East	
Comments: Disturbed spillway area prior to repair.	

Photograph ID: 90	
Photo Location: Engineered Wetland	
Image Date: 12/9/2020	
Photo Direction: South	
Comments: Localized low point at Engineered Wetland Berm was infilled with Type 10 rockfill to allow passage of runoff. Type 8 riprap placed at mouth of spillway. (Photo provided by S.McQuat, Stantec)	

Client:	Atlantic Mining NS Inc.	Project:	Fall 2020 Touquoy TMF DSI
Site Name:	Touquoy Mine Site	Site Location:	Middle Musquodoboit, NS

Photograph ID: 91
Photo Location: Engineered Wetland
Image Date: 12/7/2020
Photo Direction: North
Comments: Water discharging from the Engineered Wetland is concentrating at the bottom of the slope and starting to undermine the foundations of the Scraggy Lake Pump House. Noted in Spring 2020 DSI, repairs are yet to be completed.



APPENDIX C

INSTRUMENTATION AND MONITORING REPORT

Reference: **Vibrating Wire Piezometer (VWP) Update as of November 27, 2020
Touquoy Gold Project, Halifax County, NS**

The VWP No. 41 installed within the clay core of Polishing Pond is providing erratic data (plotted in Figure 6). A review and evaluation of this instrument is required and depending upon the findings, replacement of this instrument may be required.

We trust the information provided within this memorandum meets your current requirements. If you have any questions, please contact us at your convenience.

STANTEC CONSULTING LTD.



Jeff Gilchrist, P.Eng.
Geotechnical Engineer

Attachment: Drawing No. 19250-INS-001 Rev.7
EHH Summary Graphs (Figures 1 to 6)

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The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.
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Legend

- EXISTING WATERCOURSE
- DITCH
- 1.0 m THICK UPSTREAM CLAY BLANKET (APPROX.)
- AS-BUILT INSTRUMENTATION MONITORING LOCATION VIBRATING WIRE PIEZOMETERS (VWP)

Notes

STAMP	STAMP

No.	REVISIONS	BY	APPD.	DATE
7	UPDATE VWP LABELS AND SECTION	JG	PD	2020-07-21
6	UPDATE VWP LOCATIONS AND QUARRY	JG	PD	2019-05-10
5	UPDATE VWP LOCATIONS	JG	PD	2018-12-20
4	REVISED HISTORIC TAILINGS DISPOSAL CELL	JG	PD	2018-03-14
3	AS-BUILT LOCATIONS	JG	PD	2018-01-12
2	INDEPENDENT TAILINGS REVIEW BOARD (ITRB) COMMENTS	-	-	-
1	INCORPORATE ITRB COMMENTS	-	-	-
0	ISSUED FOR REVIEW NOT FOR CONSTRUCTION	-	-	-

CLIENT: ATLANTIC GOLD CORPORATION

PROJECT: TOUQUOY GOLD PROJECT

PROJECT LOCATION: HALIFAX COUNTY, NOVA SCOTIA

NO.	DETAILS	BY	APPD.	DATE

DRAWING TITLE: INSTRUMENTATION LAYOUT

DRAWING No.: 19250-INS-001
REVISION No.: 7

VWP No.	VWP ID	Location	VWP Serial number	Piezometer Tip Elevation (m)
1	0+200 Bedrock	Tailings Dam	1737812	105.7
2	0+800 Core	Tailings Dam	1737813	121.3
3	0+200 Core	Tailings Dam	1737814	121.8
5	0+600 Core	Tailings Dam	1737816	115.3
6	0+400 Core	Tailings Dam	1737817	120.9
7	1+600 Core	Tailings Dam	1737818	118.8
8	0+000 Bedrock	Tailings Dam	1737819	114.5
9	0+200 Bedrock	Tailings Dam	1737820	109.7
10	2+200 Core	Tailings Dam	1737821	120.1
11	1+400 Core	Tailings Dam	1737822	116.9
12	3+200 Bedrock	Tailings Dam	1737823	120.0
14	3+200 Bedrock	Tailings Dam	1737826	117.0
15	1+800 Core	Tailings Dam	1737827	117.3
17	0+000 Bedrock	Tailings Dam	1737830	111.5
22	0+600 Bedrock	Tailings Dam	1739726	105.9
23	0+600 Bedrock	Tailings Dam	1739727	102.9
24	0+970 Till	Tailings Dam	1739728	113.8
25	0+800 Till	Tailings Dam	1739729	109.8
26	0+400 Bedrock	Tailings Dam	1739730	104.4
27	1+800 Bedrock	Tailings Dam	1739731	103.3
28	1+800 Bedrock	Tailings Dam	1739732	100.3
29	2+200 Bedrock	Tailings Dam	1739733	108.4
30	1+600 Bedrock	Tailings Dam	1739734	108.5
31	1+600 Bedrock	Tailings Dam	1739735	105.5
32	2+200 Bedrock	Tailings Dam	1739736	105.4
35	0+970 Till	Tailings Dam	1739739	110.8
36	1+400 Bedrock	Tailings Dam	1739740	108.3
37	0+800 Bedrock	Tailings Dam	1739741	102.2
38	1+400 Bedrock	Tailings Dam	1739742	105.3
39	0+400 Bedrock	Tailings Dam	1739743	101.3
40	0+150 PP Clay Core	Polishing Pond Dam	1739744	109.3
41	0+325 PP Clay Core	Polishing Pond Dam	1739745	108.8

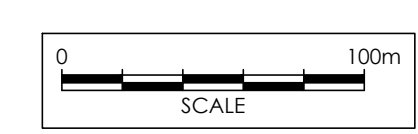
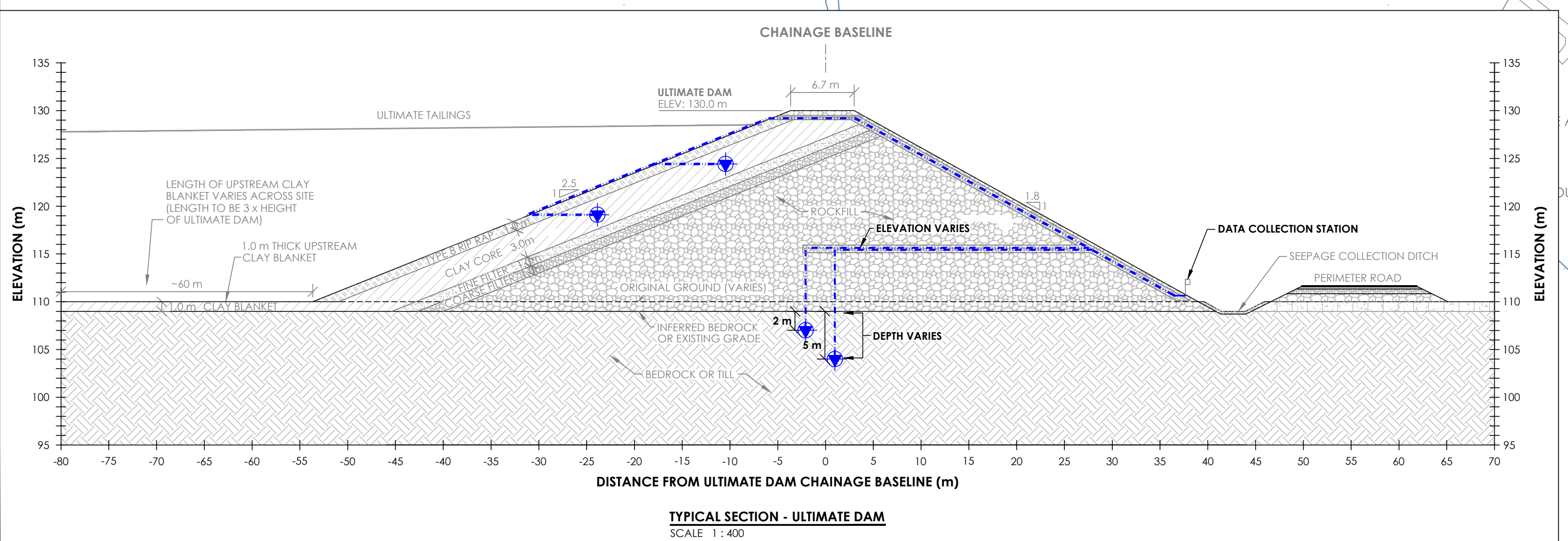
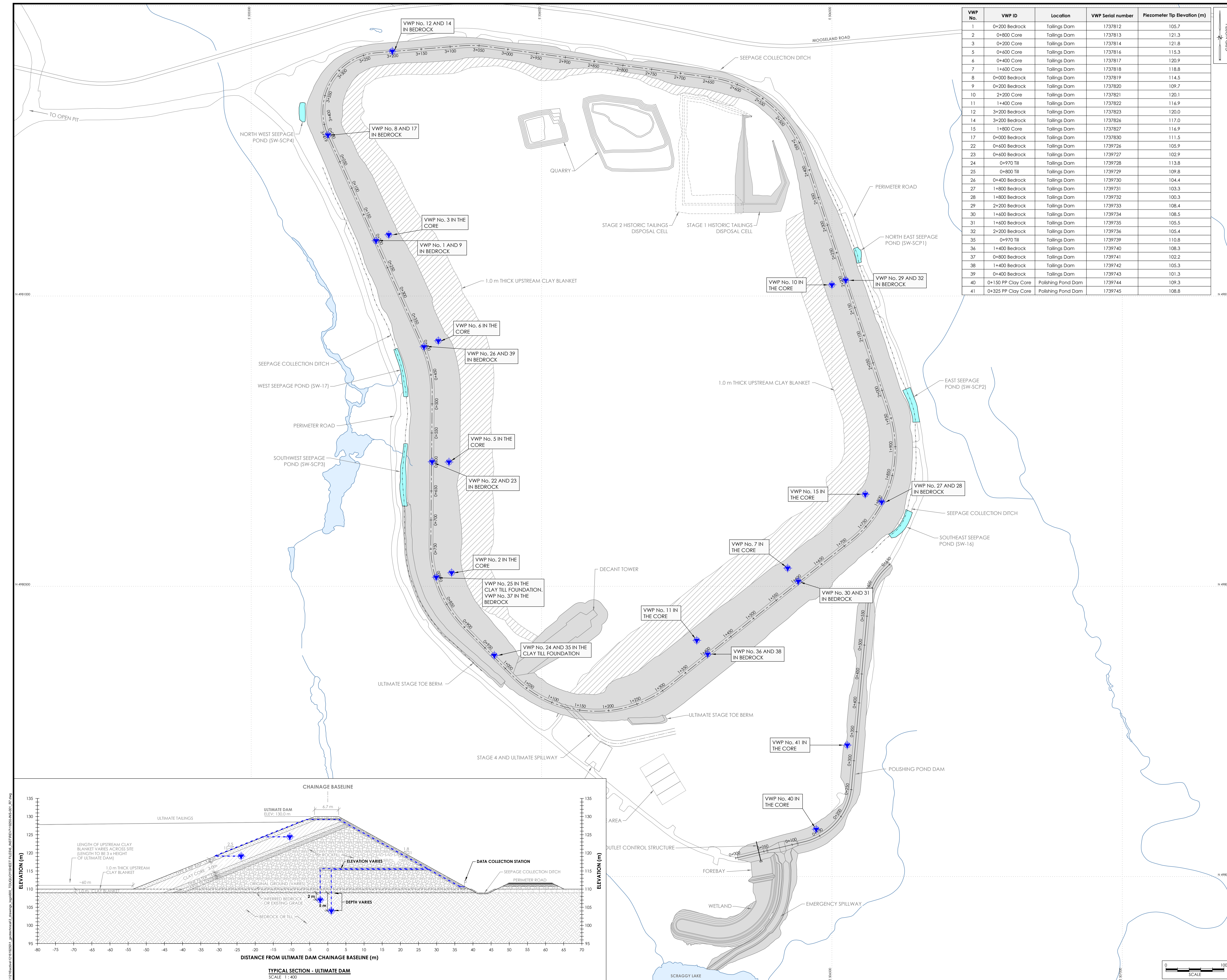


Figure 1 - Tailings Dam Piezometers in Clay Core

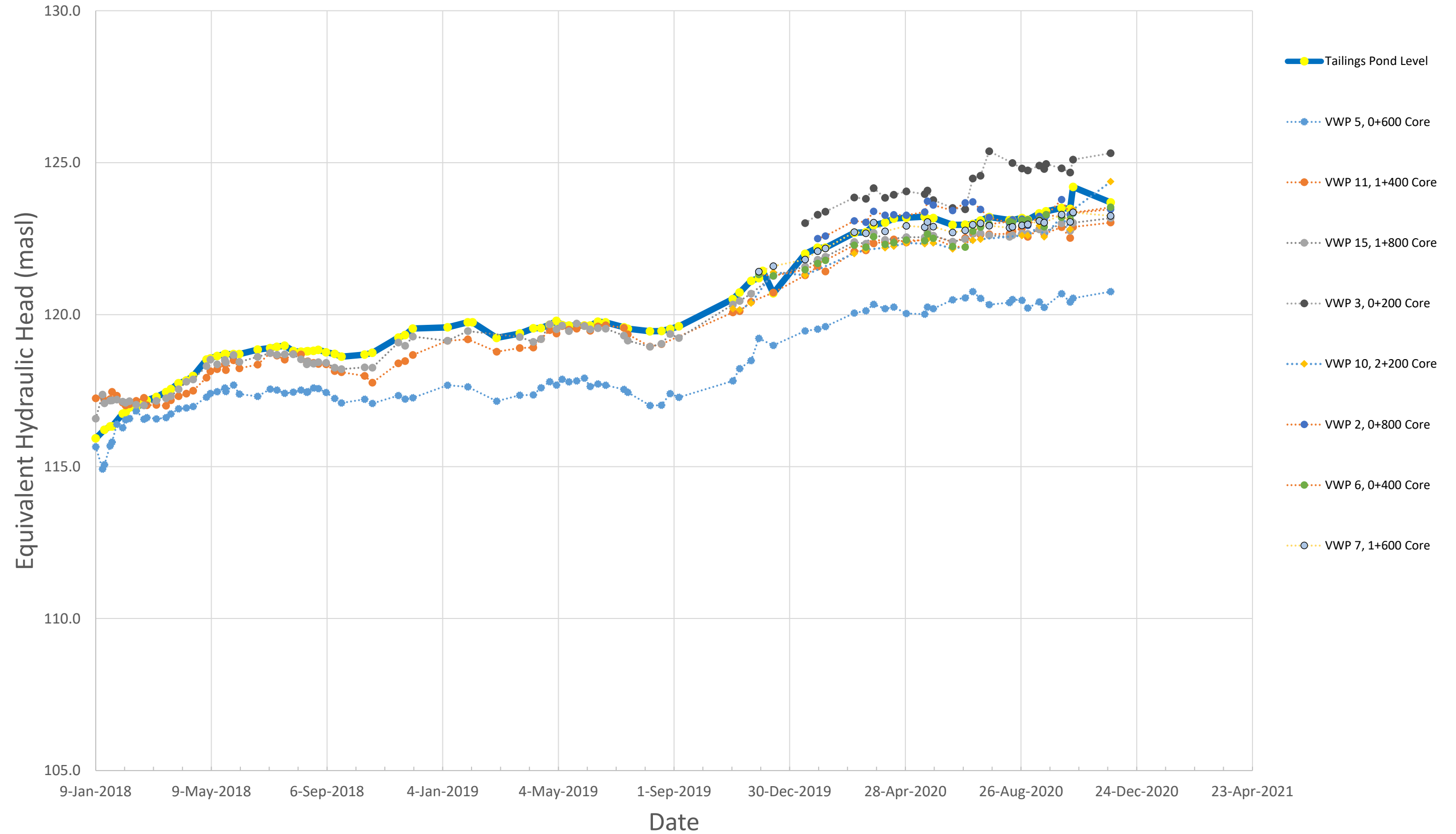


Figure 2 - Tailings Dam Piezometers in Clay Till Foundation

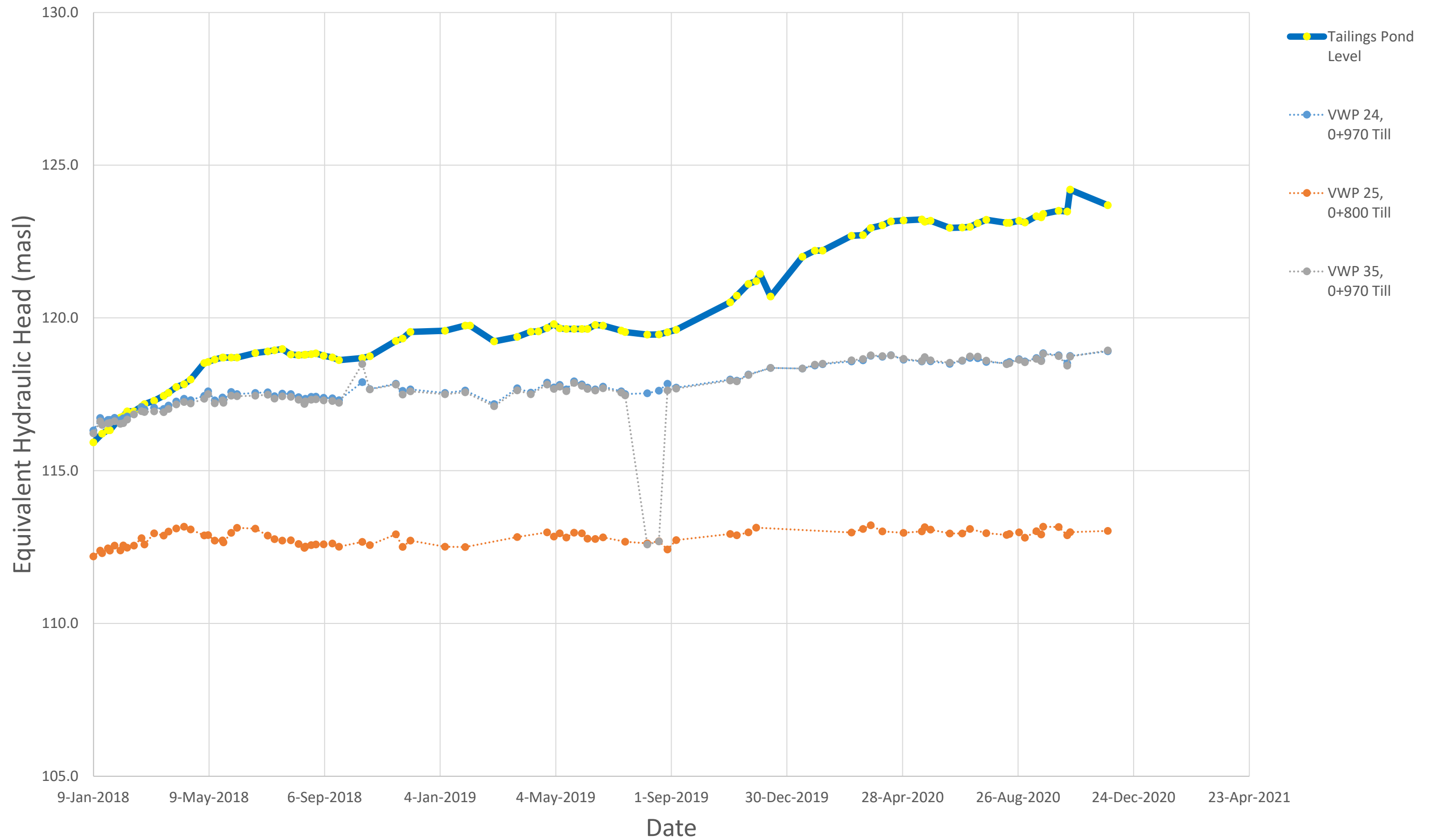


Figure 3 - Tailings Dam Piezometers in Bedrock Foundation 0+000 to 0+600

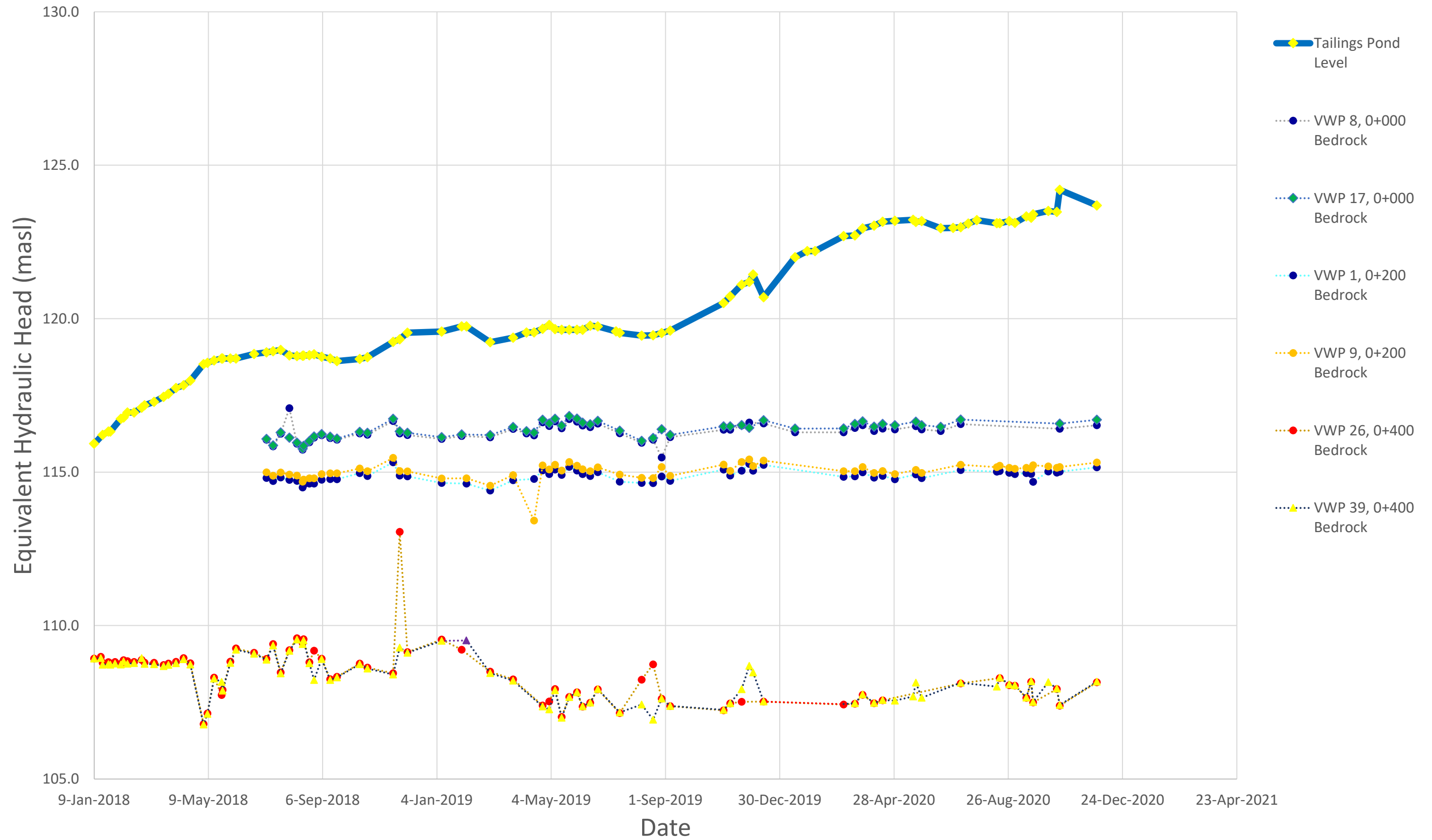


Figure 4 - Tailings Dam Piezometers in Bedrock Foundation 0+800 to 1+400

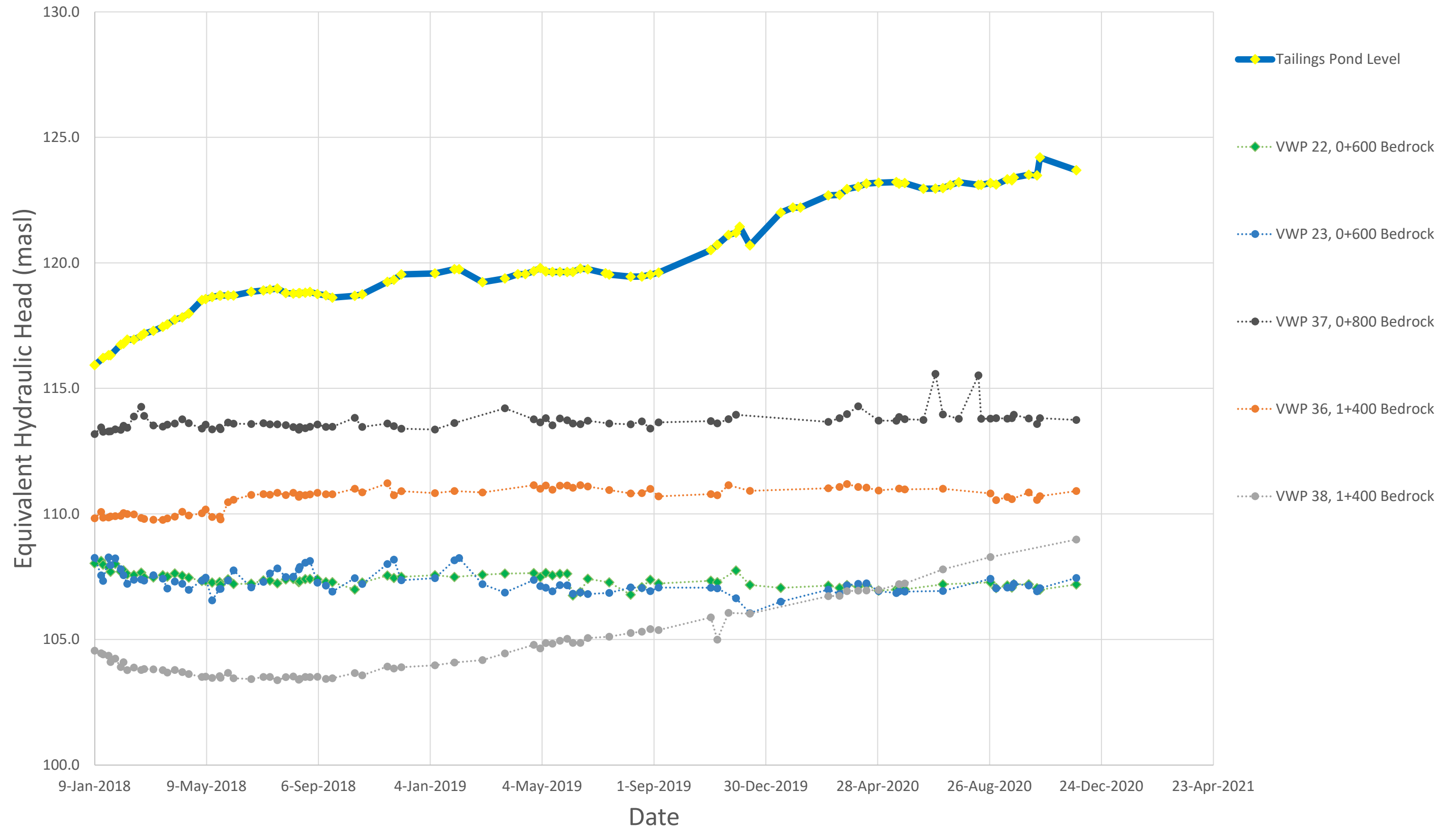


Figure 5 - Tailings Dam Piezometers in Bedrock Foundation 1+600 to 3+200

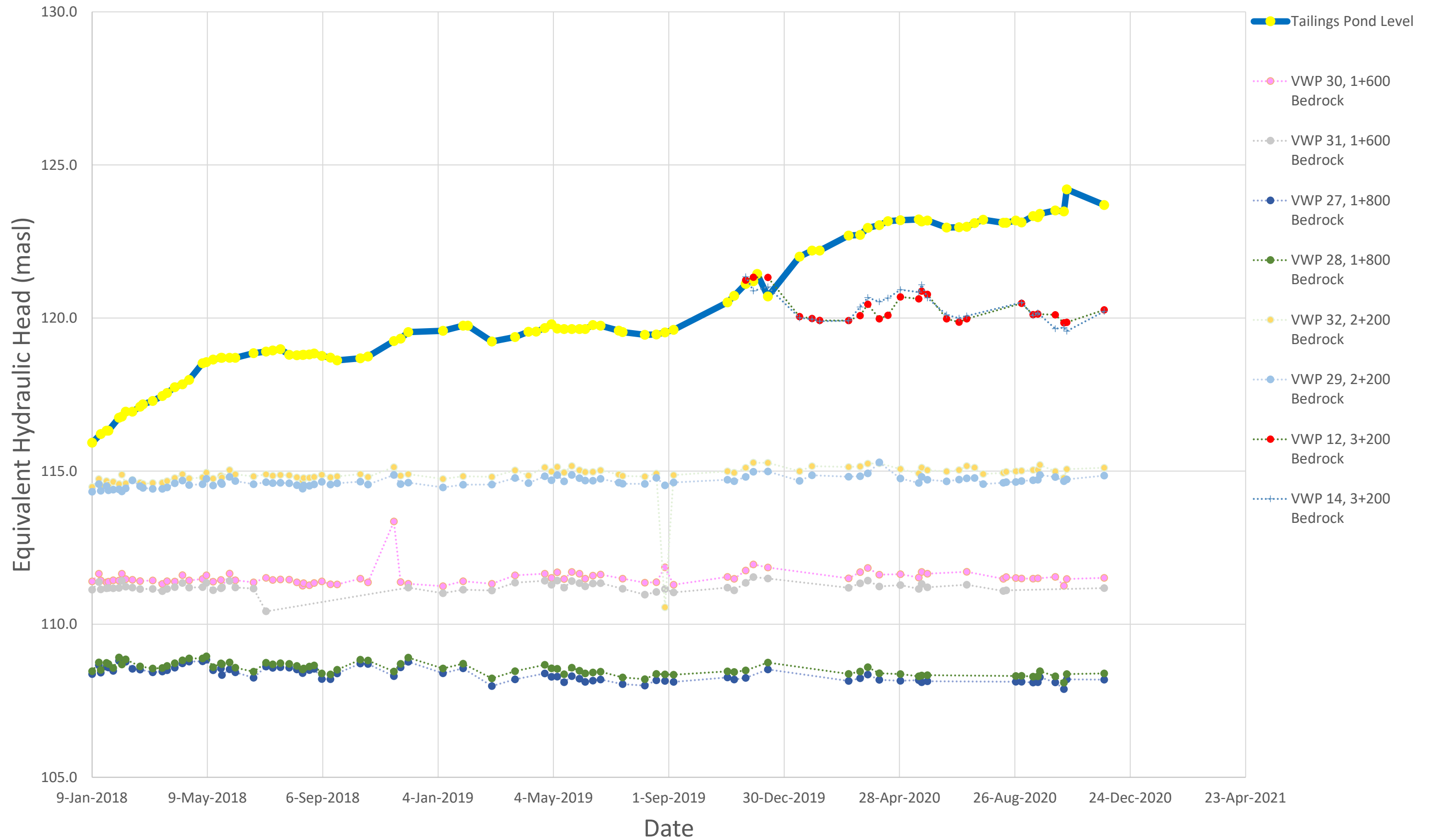
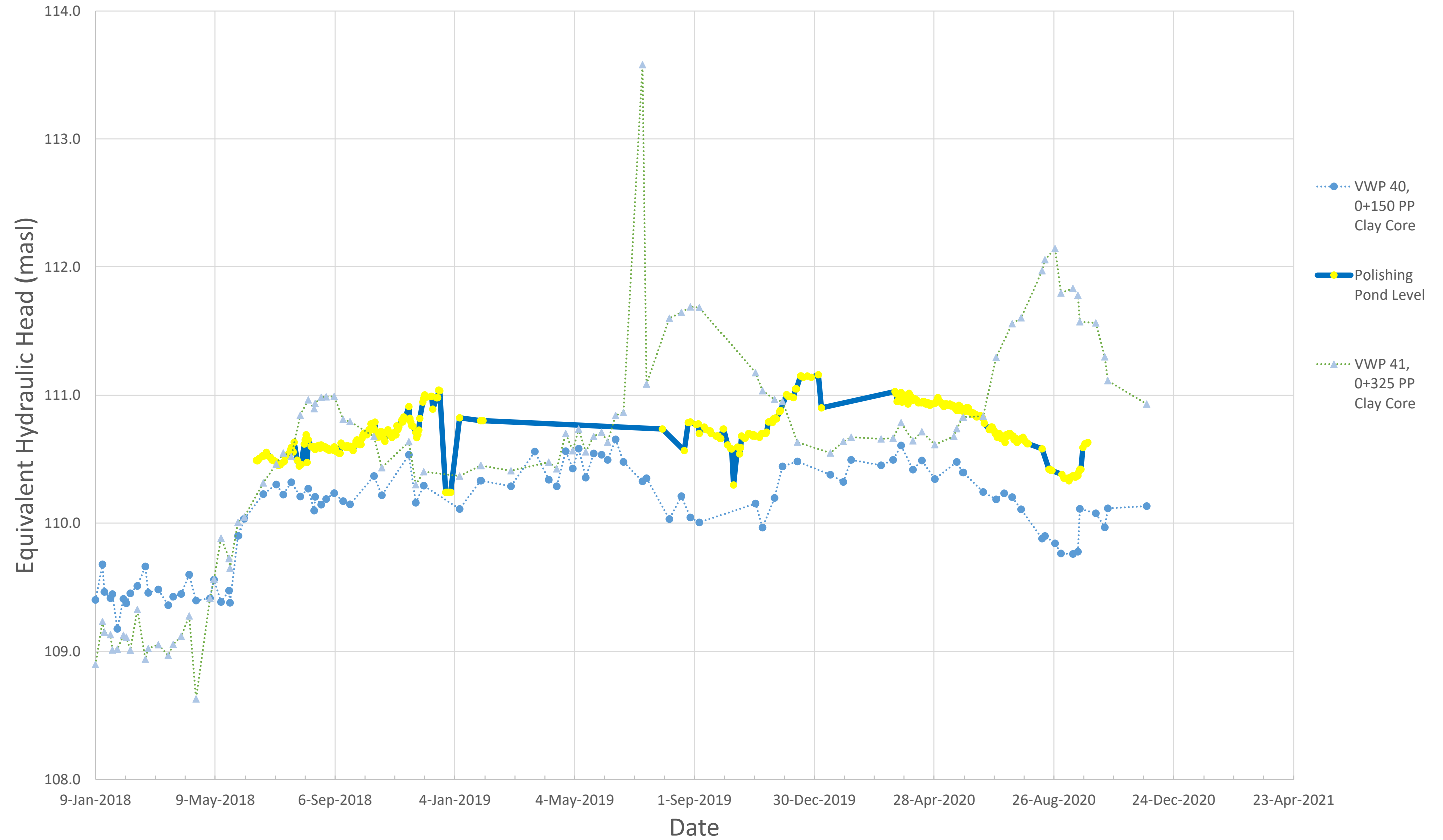


Figure 6 - Polishing Pond Dam Piezometers in Clay Core



Appendix C.4

TMF Capacity Memo – Stantec

To: **Ryan Keating**
Atlantic Mining NS Inc.

From: Paul Deering, P.Eng.
Stantec

Cc: Melissa Nicholson
Jeff Gilchrist (Stantec)

File: 121619250 Date: December 23, 2020

Doc No. MEM-181-900.300-A-23DEC20

**Reference: Touquoy TMF Capacity – Semi Annual Review, Industrial Approval No. 2012-084244-08
Touquoy Gold Mine, Moose River, NS**

With reference to Section 17 (g) of Industrial Approval No. 2012-084244-08, as Engineer of Record (EOR) for the TMF we confirm the current and forecasted capacity of the TMF will retain the projected accumulation of mine tailings and runoff, and the current stage of TMF development complies with the current Canadian Dam Association (CDA) design standards.

While review of the operations and construction of the TMF facility are continually ongoing by the EOR, the most recent water balancing report issued to Atlantic Gold confirming the TMF capacity was provided April 21, 2020 (*Water Balance Revision #13*). This report confirms the anticipated water and tailings levels within the TMF are retained through the scheduled operations and construction of dam raises through to end of 2021. Revision 14 of the water balance was completed to assess potential TMF expansion and is not relevant for currently approved design of the facility.

In addition, we are currently updating the water balance (Revision 15) to account for additional data obtained since the April 2020 submission including recent tailings bathymetry survey and operational data. It is anticipated the Revision 15 report will be completed in early 2021. Preliminary analysis show that the TMF volume is adequate to retain the projected accumulation of mine tailings and runoff as per the design.

In reference to Section 17 (g) (iv), we confirm that all modifications of the engineering design related to the dams or discharge spillways beyond the original 2016 design have been in compliance with the current Canadian Dam Association design standards.

We trust this meets your current requirements. If you have any questions, please contact us at your convenience.

STANTEC CONSULTING LTD.



Paul D. Deering, P.Eng.
Engineer of Record

To: **Ryan Keating, P.Eng.** From: Paul Deering, P.Eng.

Atlantic Mining NS Inc.

Stantec

Cc Melissa Nicolson
Paul Cobham
Rachel Jones (Stantec)
Jeff Gilchrist (Stantec)
Arun Valsangkar (Stantec)
Dan McQuinn (Stantec)

File: 121619250

Date: April 19, 2021

Doc No. MEM-193-900.300-A-19APR21

Reference: Updated TMF Capacity based on 2020 Survey, Touquoy Gold Mine, Moose River, NS

This memo presents the forecasted TMF capacity considering additional information obtained through the 2020 bathymetry and topographic surveys, and data on metered tailings volumes provide by operations. It is understood that the information provided herein will continue to be updated as additional information from operations and other studies become available.

Summary of 2020 Bathymetry and Topographic Surveys

The 2020 bathymetry and topographic survey was completed between October 22 to 23, 2020 by Heavy Civil Solutions Inc. A previous survey was completed in 2018 and 2019 with the summary provided in Stantec's memo MEM-118-900.300-A-14Jun19 and MEM-138-900.300-D-21APR20, respectively.

The 2020 survey information was used to create a tailings and water surface using MUCK-3D, a three dimensional modelling software. The model incorporated the 2020 as-built topographical surveys of the dam raise, and placement of the rockfill wedge upstream of the clay core.

The 2020 survey shows variations in the slope of the tailings surface throughout the TMF with an average beach slope of 0.58% and an average sub-aqueous slope of 1.75%. This indicates a minor beach slope variation between 2019 and 2020 from 0.5% to 0.58%. Variations of the tailings surface slopes is presented on Drawing No. 1, attached.

Using the survey data and information provided by the Mill, the TMF tailings volumes and densities were estimated and are summarized in Table 1.

**Reference: Updated TMF Capacity based on 2020 Survey
 Touquoy Gold Mine, Moose River, NS**

Table 1 - Summary of Measured TMF Tailings Volumes and Tonnage

Deposition Period	Surveyed Placed Volume (m ³)	Mill Throughput Records (t)	Calculated Bulk Density (t/m ³)
Startup (TMF Base) to July 10, 2018*	1,008,000	1,410,831	1.400
Startup (TMF Base) to October 26, 2019**	3,122,366	4,384,694	1.404
Startup (TMF Base) to October 23, 2020	4,897,000	7,077,381	1.445

* Information from Stantec Doc No. MEM-118-900.300-A-14JUN19

** information from Stantec Doc No. MEM-138-900.300-D-21APR20

In reference to the original design, tailings slopes were assumed to be at 1% for subaerial deposition (i.e., beached) and 3% for subaqueous. In addition, the design assumed that the average deposited dry density of tailings in the TMF would increase overtime as provided in Table 2. However, based on the results of the recent survey, we note that both the overall slopes and deposited dry densities are lower than that assumed in the original design. These differences may be attributed to the common method of tailings deposition being through end of pipe in the first two years of operation, as opposed to spigotting.

While the overall deposited bulk density is below the design it is observed to be increasing over time, notably between the 2019 and 2020 bathymetric surveys. This is aligned with the design assumption and could be attributed to the increased use of spigotting for tailings deposition.

Table 2 - Summary of Original TMF Design Parameters (2016/2017)

Dam Stage	Crest Elevation (m)	Top of Tailings Beach (m)	Total Deposition (Months)	Required Tailings Volume (m ³)	Available Storage Capacity (m ³)	Buffer or Excess Capacity (m ³)	Void Ratio	Deposited Bulk Density (t/m ³)*
Com.	116.5	114.5	3	212,014	275,786	63,772	1.0	1.42
Stage 1	121.0	119.5	12	1,246,643	1,337,000	90,357	0.960	1.44
Stage 2	123.5	122.5	24	2,604,947	2,760,000	155,053	0.940	1.46
Stage 3	126.0	124.5	36	3,945,230	4,063,757	118,527	0.925	1.47
Stage 4	128.0	127.0	48	5,305,654	5,672,000	366,346	0.925	1.47
Stage 5**	130.0	128.0	60	6,326,530	6,426,000	99,470	0.920	1.47

*Specific Gravity of 2.83 used

**Stage 5 represents original design ultimate dam height based on total mill throughput of 9,300,000 t

TMF Available Storage Capacity

A summary of the historical and current estimated available tailings storage volumes are summarized in Table 3. The results show a slight increase in capacity compared to the original design assumptions primarily due to tailings surface geometry and other modifications and changes inside the TMF footprint.

**Reference: Updated TMF Capacity based on 2020 Survey
 Touquoy Gold Mine, Moose River, NS**

The water volume in the pond is anticipated to vary during operation month by month, based on climate conditions, water requirements and operation of the effluent treatment plant. Previously, this volume varied from approximately 400,000 m³ to 1,000,000 m³ of water storage. This variance is incorporated into the storage capacity volume estimates below. This value was updated to reflect operational requirements to a maximum of approximately 700,000 m³ for this update.

Table 3 - Summary of TMF Ultimate Storage Capacity (Max Tailings Elev. 128.0m)

Case and Assumptions	Ultimate Capacity ¹ (m ³) (estimated tons in brackets)
<u>Original Design Case 2016/2017</u> <ul style="list-style-type: none"> Refer to Table 1 above 1 M m³ of water storage, resulting in high normal operating water level = 125.8 m 	<p align="center">6,426,000 m³ (Using 1.47 t/m³ = 9,446,220 t)</p>
<u>Based on 2018 Bathymetric Survey and Water Balance Rev. 12</u> <ul style="list-style-type: none"> Tailings slope of 1% above water and 3% below 1 M m³ of water storage, resulting in high normal operating water level = 127.0 m 	<p align="center">6,688,000 m³ (Using 1.47 t/m³ = 9,831,360 t)</p>
<u>Based on 2019 Bathymetric Survey and Water Balance Rev. 13^{2 & 3}</u> <ul style="list-style-type: none"> Tailings slope of 0.5% above water and 1.75% below Maximum water elevation at 128.0 m, results in a maximum of 850,000 m³ water storage 	<p align="center">7,758,000 m³ (Using 1.41 t/m³ = 10,938,078 t) (Using 1.40 t/m³ = 10,861,200 t)</p>
<u>Based on 2020 Bathymetric Survey</u> <ul style="list-style-type: none"> Tailings slope of 0.58% above water and 1.75% below Maximum water elevation at 128.0 m, results in a maximum of 703,700 m³ water storage Refer to attached Drawing No. 2 for this case.	<p align="center">7,790,000 m³ (Using 1.44 t/m³ = 11,217,600 t) (Using 1.45 t/m³ = 11,295,500 t)</p>

Notes:

- Volumes have been rounded for this table to the nearest 1,000 m³
- In order to contain one IDF below the spillway invert elevation, the maximum operating water level of 128.0 was used. In order to maintain this maximum water level, adjustment to the ETP operation schedule may be required during the final months of operation.
- The ultimate capacity reported based on the 2020 survey does not account for the recommended minimum of 0.5 m of storage to allow for model uncertainty and potential changes in assumptions of tailings deposition.

Using the results of the 2020 bathymetry survey the remaining available storage in the TMF as of October 23, 2020 is as follows (values rounded to the nearest 1,000):

- Ultimate Capacity (Table 3) = 7,790,000 m³
- Used (Surveyed Placed Volume (Table 2)) = 4,897,000 m³
- Available = 2,893,000 m³

**Reference: Updated TMF Capacity based on 2020 Survey
Touquoy Gold Mine, Moose River, NS**

Closure

We trust this memo will be satisfactory to support planning efforts at the Touquoy mine. It is understood that the information provided herein will continue to be updated as additional information from operations and other studies become available.

If you have any questions, please contact us at your convenience.

Regards,

Stantec Consulting Ltd.



Paul Deering , P.Eng.
Engineer of Record

Attachments: Drawing Nos. 1 and 2

NOTES:

1. ABOVE WATER TAILINGS BEACH SLOPE (-0.58% AVERAGE) BASED ON TOPOGRAPHIC SURVEY OF EXPOSED TAILINGS (HEAVY CIVIL SOLUTIONS INC.; OCTOBER 22, 2020).
2. SUBMERGED TAILINGS BEACH SLOPE (-1.75% AVERAGE) BASED ON BATHYMETRY SURVEY (HEAVY CIVIL SOLUTIONS INC.; OCTOBER 22-23, 2020).



THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

OCTOBER 2020 TAILINGS SURVEY
 TOUQUOY MINE TAILINGS MANAGEMENT FACILITY
 HALIFAX COUNTY, NOVA SCOTIA

Client: ATLANTIC MINING NS INC.

Job No.: 121619250

Scale: 1 : 6000

Date: 2021 04 07

Dwn. By: JL

App'd By: JG

Dwg. No.: 1



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NOTES:

1. ABOVE WATER TAILINGS BEACH SLOPE (-0.58% AVERAGE) BASED ON TOPOGRAPHIC SURVEY OF EXPOSED TAILINGS (HEAVY CIVIL SOLUTIONS INC.; OCTOBER 22, 2020).
2. SUBMERGED TAILINGS BEACH SLOPE (-1.75% AVERAGE) BASED ON BATHYMETRY SURVEY (HEAVY CIVIL SOLUTIONS INC.; OCTOBER 22-23, 2020).
3. TAILINGS PLACED AS OF OCTOBER 23, 2020 BASED ON BATHYMETRY SURVEY.
4. TAILINGS DEPOSITION MODELING DONE WITH MUK3D TO DETERMINE STORAGE AVAILABLE BETWEEN OCTOBER 23, 2020 AND MAX. TAILINGS STORAGE CAPACITY: 2,893,400 m³.
5. ALL VOLUMES ARE APPROXIMATE.

TOTAL TMF TAILINGS STORAGE	7,790,400 m ³
MAXIMUM TAILINGS ELEVATION	128.0 m
MINIMUM WATER STORAGE VOLUME	262,160 m ³
MINIMUM WATER STORAGE ELEVATION	127.2 m
MAXIMUM WATER STORAGE VOLUME	703,700 m ³
MAXIMUM WATER STORAGE ELEVATION	128.0 m

TOTAL TMF TAILINGS STORAGE: 4,897,000 m³ (SEE NOTE 3)
 + 2,893,400 m³ (SEE NOTE 4)
 = 7,790,400 m³



THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

TMF MAXIMUM TAILINGS PROJECTION
 TOUQUOY MINE TAILINGS MANAGEMENT FACILITY
 HALIFAX COUNTY, NOVA SCOTIA

Job No.: 121619250

Dwg. No.: 2

Scale: 1 : 6000

Date: 2021 04 07

Dwn. By: JL

App'd By: JG



Client: ATLANTIC MINING NS CORP

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Water Balance Revision #13

Touquoy Gold Project
Halifax County, Nova Scotia

April 21, 2020

Prepared for:

Atlantic Mining NS Corp.

Prepared by:

Stantec Consulting Ltd.
845 Prospect Street
Fredericton, New Brunswick
E3B 2T7

Project: 121619250
Doc No.: RPT-xxx-900.300.A-31Mar20

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Definitions (CDA 2013)

Active storage	The capacity for water storage in the tailings pond between the maximum and minimum normal operating water levels.
Available storage	The volume of storage capacity in the tailings pond at any one time, between the pond level at that time and the Maximum Normal Water Operating Level.
Dead (inactive) storage	The volume of water that is constantly maintained in the tailings pond and cannot be purged through the installed water management infrastructure (i.e., the reclaim system).
Environmental Design Flood (EDF)	The <i>Environmental Design Flood</i> is the most severe flood that is to be managed without release of untreated water to the environment. The EDF volume is equal to the volume that can be stored in the pond between the maximum normal operating level and the spillway invert elevation.
Freeboard	With mining dams, there are three types of freeboard that may be referred to: <i>Normal freeboard</i> is the difference in elevation between the lowest elevation of the top of the dam and the <i>Maximum Normal Operating Water Level</i> . <i>Minimum freeboard</i> is the difference in elevation between the lowest elevation of the top of the dam and the maximum still pool reservoir level that would result should the <i>Inflow Design Flood</i> occur. <i>Tailings Freeboard</i> is the minimum difference in elevation between the lowest elevation of the top of the dam and the highest point of the tailings surface adjacent to the dam. This term is generally only applicable when tailings are deposited sub-aerially onto a tailings beach.
Inflow Design Flood (IDF)	The <i>Inflow Design Flood</i> is the most severe inflow flood (peak, volume, shape, duration, timing) for which a dam and its associated facilities are designed. This includes maintaining <i>minimum freeboard</i> throughout the course of the event.
Maximum normal operating level (Max. NOWL)	The maximum allowable water level in the tailings pond under normal (non-flooding) conditions. Storage above the Max NOWL includes the EDF without discharge and the IDF while maintaining the required <i>minimum freeboard</i> .
Minimum normal operating level (Min. NOWL)	The water level corresponding to the greater of either: The volume required to provide adequate pond residence time to meet reclaim water quality requirements, or The <i>dead storage</i> water level.
Total required storage volume	The sum of the <i>active</i> , and <i>dead (inactive)</i> , and IDF <i>with no spillway</i> .
1:100 year climate condition	The 1:100 year climate conditions were estimated based on a frequency analysis of the Middle Musquodoboit climate station data from 1961 to 2011. Monthly distributions of the 1:100 year annual precipitation used in the water balance modelling were derived using the distribution trends observed in 1972 for wet years, and in 1992 for dry years.



1.0 INTRODUCTION

This Revision #13 memo presents an update to Water Balance Revision #12 (Stantec 2019) that was issued on June 21, 2019. This revision projects the water balance to March 2022, coincident with the ultimate capacity of the Touquoy TMF, to provide guidance to Atlantic Gold (AMNS) for planning of construction activities related to raising the Tailings Management Facility (TMF) Dam over this period.

Periodic updates to the water balance are required during the development of the TMF, to incorporate updated processing and hydrologic information as it becomes available. The present update should be considered in this broader context.

The water balance Revision #13 was specifically prepared to account for:

- Modified tailings deposition plan
- Recent bathymetry and topographic survey
- Modification of inflows based on model calibration to metered records and reports from AMNS
- Climate data from local weather station, and the onsite weather station
- Position/operation of the decant barge, as opposed to the decant tower

2.0 MODELING NOTE

The water balance model is a dynamic tool developed through multiple iterations and revisions during design, construction, commissioning, and operation. Updated and supplemental information has been integrated into the model progressively to help improve its accuracy.

Model projections are based on our understanding of seasonal climate variability, seepage hydraulic conductivity and gradient, processing rates, and water uses. The accuracy of the model in predicting future conditions is contingent on the accuracy of the model inputs. Therefore, to improve model accuracy, controllable inputs such as discharge and dewatering rates should be maintained and measurable parameters such as precipitation, temperature and pumping rates should continue to be monitored.

Notwithstanding measurable inputs, the water balance model predicts future conditions based on a wet year climactic scenario in conjunction with the assumption of no ETP discharge in the winter, to conservatively predict maximum water levels and storage requirements. The model also simulates dry year conditions to estimate minimum water storage levels and volumes, and the requirements to maintain adequate water reservoir conditions necessary to continue mining. These operating scenarios form upper and lower water management requirements of the TMF and assist AMNS to plan construction and operation of the TMF.



3.0 WATER BALANCE METHODS

This revision to the water balance used the same model as the Water Balance Report (Stantec 2016b) developed in Microsoft Excel®. The model has been adjusted to incorporate measured parameters and calibrated to match the simulated and the measured pond volumes over time.

All elevations are reported relative to the Canadian Geodetic Vertical Datum of 2013 (CGVD2013).

3.1 CLIMATE

Forecasts of pond levels were simulated for three annual climatic conditions including:

- Climate normal;
- 1:100 year wet; and
- 1:100 year dry.

As discussed in Revision #12, wet and dry climate statistics were calculated from the annual precipitation for the available record of the Halifax International Airport climate station (Station ID 8202251). The precipitation record was fit to a Pearson Type III distribution to estimate the 1:100 year events. The wet year was distributed monthly based on the wettest year of record in 1972. Similarly, the dry year was distributed monthly based on the driest year of record 1965. Climate normal conditions was assumed as the 1981 - 2010 record. To identify a worst-case scenario on high and low water levels in the TMF from precipitation events, the sensitivity on the 1:100 year wet and 1:100 year dry monthly distribution of precipitation was modelled as a separate scenario.

The 1:100 wet year is an actual year (1972) observed in the record that closely matched the total annual 1:100 year wet precipitation. In addition, the available pond storage or pond level is predicted based on the 1:100 year wet climate conditions, which has approximately 30% more precipitation than a normal year. Similar to Rev. 12, pond evaporation is based on climate normal lake evaporation at the Truro climate station (ECCC 2015b).

3.2 TMF STORAGE

The 2019 bathymetry and topographic survey was completed between October 21 to 26, 2019 by Heavy Civil Solutions Ltd. The 2019 survey information was used to create a tailings and water surface using MUCK-3D, a three-dimensional modelling software. The modelled surface was compared to the available drone imagery provided by AMNS dated end of September 2019, to visually examine the agreement of the shape of the tailings and pond surface. The MUCK-3D tailings surface incorporated survey information for the following areas of TMF

- 2019 as-built topographical surveys provided by AMNS of the dam embankment raise (August 2, 2019)
- Extension of the decant pad (Decant top of rock October 31, 2019)
- Placement of the historic tailings cell 1 rip-rap (August 5, 2018)
- Historic tailings cell 2 rip-rap (August 5, 2018)
- Clay cap (February 12, 2020)
- Frost Blanket (May 15, 2019)
- East Island (High area in middle of the tailings pile December 11, 2019)



WATER BALANCE REVISION #13

- Cofferdam (December 11, 2019)
- Arsenic contaminated soil pile on the northwest corner of the TMF (February 12, 2020).

As discussed in Section 5, the TMF tailings volume and average dry deposited density were estimated using the survey data and metered records of tailings dry tonnage provided by the mill. The average beach slope measured in the 2019 bathymetry survey was used to forecast tailings storage until the TMF is at capacity (i.e. the top of tailings beach elevation of 128.0 m). Monthly tailings pond stage storage curves were derived to predict the pond level on a monthly basis. Curves were interpolated for 2 of 3 months from August 2020 to ultimate capacity.

Table 3.1 summarizes the tailings storage and design assumptions by stage of TMF construction. As of the end of March 2020, the mine has been in operation for approximately 30 months and the TMF is between Stage 2 and Stage 3.

Table 3.1 Summary of Tailings Storage and design Assumptions by Stage

Stage	Crest Elevation (m)	Total Deposition (Months)	Required Tailings Volume (m ³)	Required TMF Water Volume (m ³)	Void Ratio	Deposited Density (t/m ³)*
Commissioning	116.5	3	212,766	250,000	1.000	1.42
Stage 1	121.0	12	1,250,000	1,000,000	0.960	1.44
Stage 2	123.5	24	2,602,740	1,000,000	0.940	1.46
Stage 3	126	36	3,945,578	1,000,000	0.925	1.47
Stage 4	128	48	5,306,122	1,000,000	0.925	1.47
Stage 5	130	60	6,326,531	1,000,000	0.920	1.47

*Specific Gravity of 2.83 used for design.

3.3 MINIMUM ELEVATION OF TAILINGS DAM

Since the TMF does not yet have a spillway, the height below the dam clay core (i.e., low permeability core) represents the total required storage volume to contain the entire IDF. Long-term water and tailings storage in the TMF should be maintained below the top elevation of the clay core. When estimating the required height of the clay core, total water storage during the 1:100 year wet climate scenario plus the inflow design flood storage and freeboard were considered. This approach results in a conservatively high storage estimate, due to the unlikely scenario of the inflow design flood (IDF) storm occurring during the 1:100 year wet climate conditions within the next few years of mine life.

Freeboard requirements are defined by the CDA based on the selected dam classification to protect the structure from overtopping by flood events and/or by wind induced waves. Minimum freeboard was calculated to be 0.7 m below the dam crest.

3.4 OPERATION OF EFFLUENT TREATMENT PLANT

The ETP has been shutdown since August 2019 and is expected to be restarted mid-March 2020. Runoff has been stored on the TMF while maintaining water levels below the IDF level. As the pond volumes were low in August and September 2019, the planned routine shutdown of the ETP during the four frozen months of December – March was commenced early. The water balance forecasts inform the ETP requirements to meet operational water management objectives of the TMF.



WATER BALANCE REVISION #13

At the request of AMNS and based on ETP rates in early 2019, an ETP rate of 300 m³/hr was simulated to represent future operation of the ETP for the months of April through November, inclusive. This ETP rate considers scheduled maintenance and shutdowns.

In the current water balance simulation, no discharge through the ETP was assumed for the months of December through March. This is AMNS preferred operational practice to avoid operating the ETP during frozen weather conditions. Further details on the ETP operations are presented in Section 7.2.

3.5 MINIMUM WATER STORAGE

Inactive storage is maintained in the TMF to reduce the risk of a water shortage resulting in a mill shutdown. The minimum inactive storage for process water supply, and the minimum water depths for decant barge pumping including ice-water sequestration, has been considered in the water balance model using the dry climate scenario

The TMF inactive storage criteria is as follows:

- **Process Water Supply Criteria:** Process water supply requirements for frozen and non-frozen periods, based on the maximum of 1:100 year dry climate conditions and maximum monthly water deficit of the TMF water balance assuming no rainfall. The volume under dry conditions was assessed based on a review of the maximum consecutive days without rainfall observed at the Halifax climate station (Station ID 8202250/8202251). Days without rainfall was assumed as less than 1 mm of rainfall over 24 hours.
- **Operational Barge Criteria:** A water depth of 3 m is required for efficient operation of the decant barge pump (i.e., operational head requirements).
- **Ice Sequestration:** An additional 0.5 m is required during winter operation (i.e., frozen conditions) for ice-water sequestration water/ice depth. The Stefan equation was applied to the daily average temperature at the Halifax climate station to estimate ice thickness.

3.6 MAXIMUM WATER STORAGE

The ultimate TMF capacity was modelled base on a minimum water elevation of 128.0. The remaining water storage at that elevation is 850,000 m³. Therefore, operation of the ETP for the final months of production was modified to not exceed this maximum water storage. The ETP will require to be in operation over the frozen months to maximize the tailings volume deposited in the TMF.

4.0 WATER BALANCE MODEL INPUTS

4.1 CLIMATE

Historical climate data from Environment Canada's Halifax International Airport climate Station ID 8202251 for the past year is presented in Figure 4.1, alongside the three annual climate conditions. The 1:100 year wet total precipitation is 1954 mm and the 1:100 year dry total precipitation is 979 mm. As shown in the figure, the Halifax station measured approximately 1469 mm of total precipitation between February 2019 and January 2020 (inclusive), slightly higher than the climate normal precipitation for the same months of 1452 mm.



Starting in November 2019, a meteorological station was installed onsite within the Mill infrastructure area. As shown in Figure 4.1, the onsite meteorological station measured precipitation close to the Halifax station for the months of November and December. Total precipitation in January 2020 was approximately half of the Halifax Station precipitation. The water balance was calibrated for the months of November through January using on-site climate data. The Halifax station climate conditions or proportion as snow storage was not adjusted based on the onsite climate station as the record is too short.

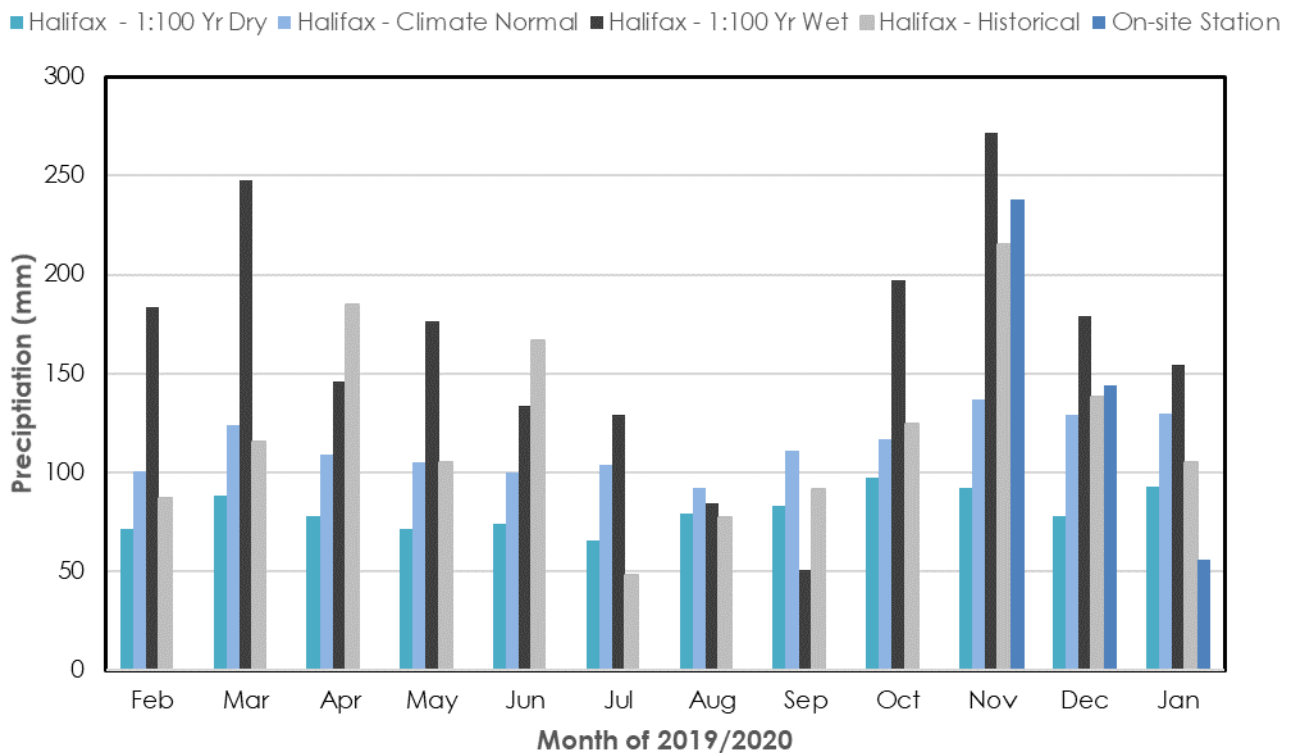


Figure 4.1 Halifax and On-site Climate Station - Total Precipitation

4.2 MODEL INPUT CALIBRATION TARGETS

The Revision #13 model has been calibrated to the end of January 2020, as outlined in the Table 4.1. Model inputs were adjusted to match measured values between February 2019 and January 2020, inclusive. An understanding of the adjustment of the model input parameters allows continuous improvement of the forecast through calibration thus reducing model uncertainties.

As shown in Table 4.1, simulated flows for the inputs to the TMF from the open pit, mill, and waste rock pond were higher than the metered pump records. These inputs were reduced for the Revision 13 water balance forecast.



WATER BALANCE REVISION #13

Table 4.1 Model Input Calibration

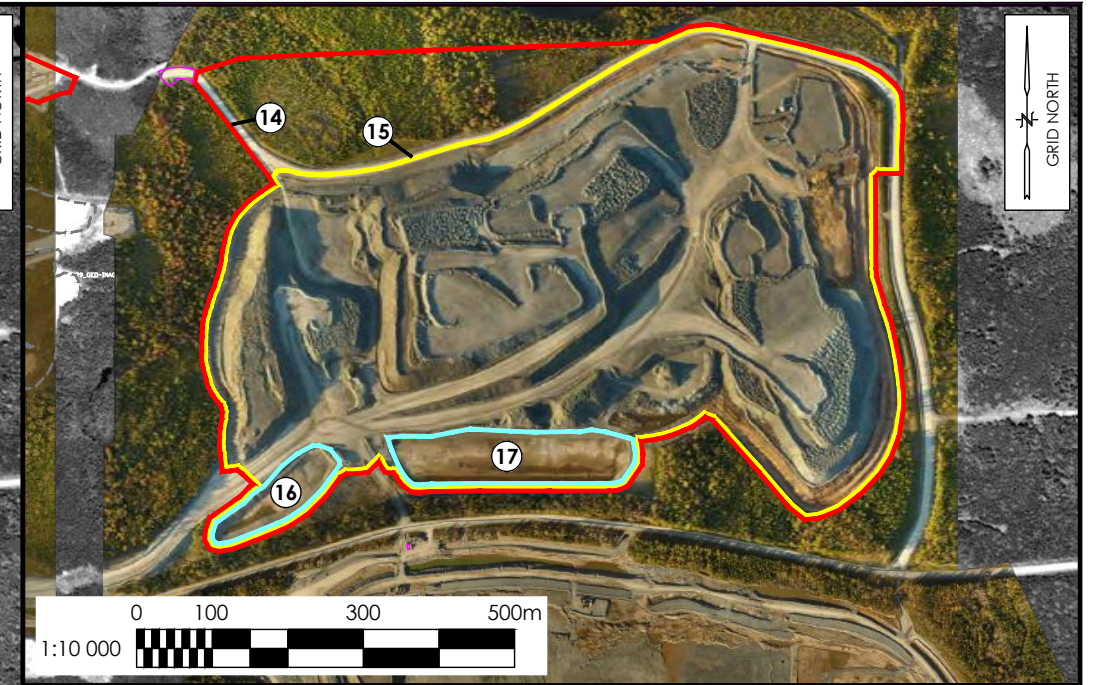
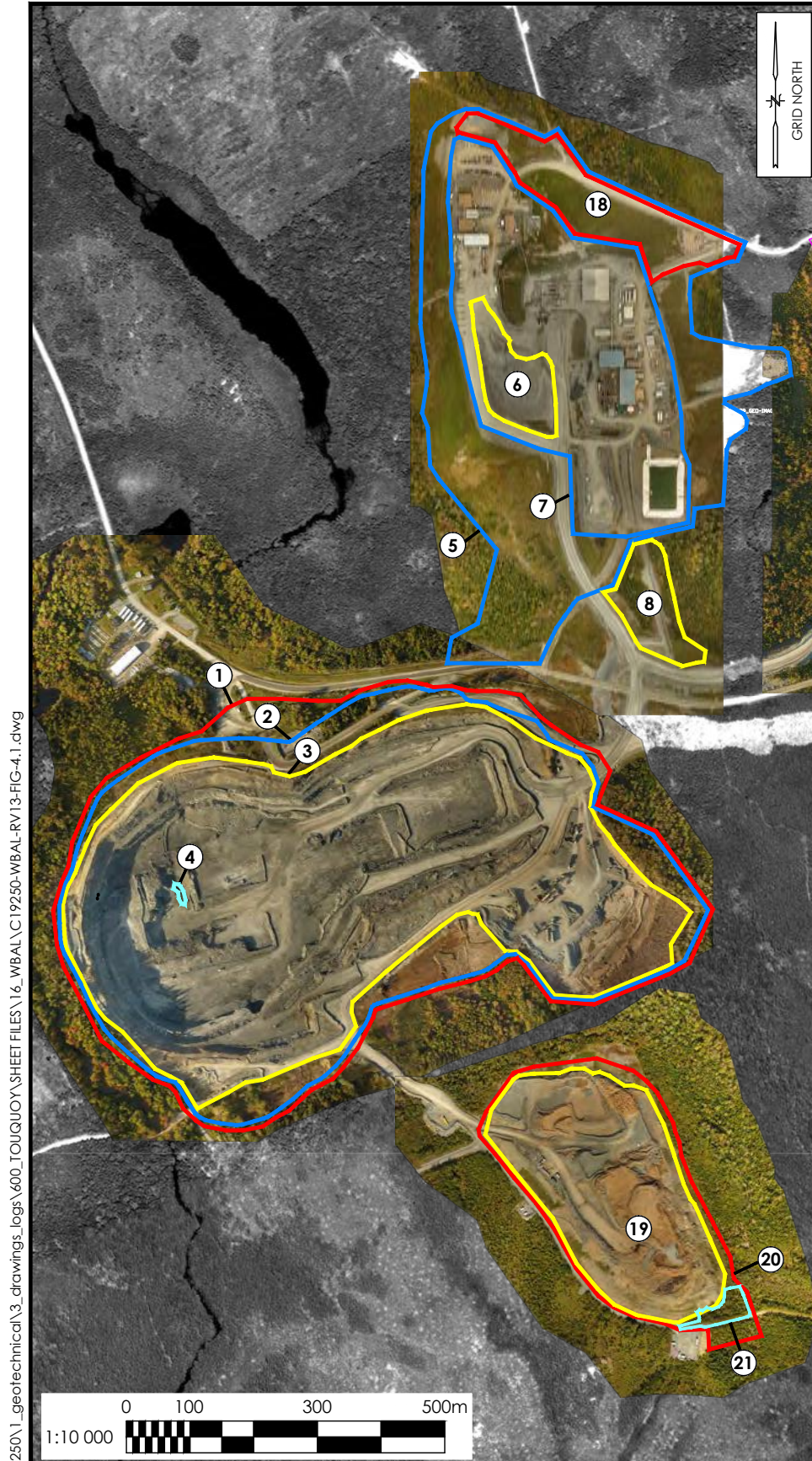
Measured Parameters	Measured	Forecasted (-) higher, (+) lower	Model Input Parameter Adjustment
Open Pit (Feb 2019 – Jan 2020)			
Open Pit Dewatering	484,783 m ³	+227,057 m ³	Reduced runoff coefficient Pit walls 0.9 to 0.6, Prepared ground 0.9 to 0.75
Mill - Process Flow (Feb 2019 – Jan 2020)			
Water in Tailings Discharged from the Mill to the TMF	3,160,620 m ³	+299,010 m ³	Increased slurry density 0.41 to 0.432 of tailings production
Freshwater make-up from Scraggy to mill	139,963 m ³	+43,377 m ³	% of tailings production as freshwater 5.8 to 4.42%
Recycled water to the Mill from TMF (Decant)	3,009,265 m ³	+47,935 m ³	Reduced water lost to evaporation & spillage 3.0% to 1.5% of tailings production
Waste Rock Pond (April 2019 – January 2020)			
Waste Rock Pond	230,182 m ³	+372,881 m ³	Reduced runoff coefficient Prepared ground 0.85 to 0.3, Pile from 0.5 to 0.05
Tailings Management Facility (Feb 2019 – Jan 2020)			
Mill Feed Dry Tonnes	1,797,010 m ³ - metered (deposited dry density of 1.406 t/m ³)	+304,946 m ³ (deposited dry density of 1.400 t/m ³)	Avg. 165,303 m ³ /month
TMF Seepage to Collection Ditch West	285,633 m ³	-89,859 m ³	Reduce average daily volume from 536 to 775 m ³
TMF Seepage to Collection Ditch East	105,333 m ³	+40,767 m ³	Reduce Avg. monthly volume from 400 to 290
Effluent Treatment Plant (Totalizer FI1461)	-1,371,384 m ³	-142,768 m ³	Continue forecast of 300 m ³ /hr
Results of TMF Bathymetry Survey			
Water Volume end of October 2019, Elev. 121.51 m	470,503 m ³	+58,118 m ³	Increased seepage to GW from TMF -400 to - 500 m ³ /d Decreased runoff coefficient of prepared ground from 0.95 to 0.85 and tailings beach from 0.95 to 0.92

4.3 DRAINAGE AREA

As additional drone topographic point data and imagery were available, mine site component drainage areas were adjusted to reflect existing conditions, as depicted in Figure 4.2. Modifications to the water management system that are proposed for 2020 include:

- Runoff from the Scraggy Overburden Stockpile will be collected and pumped to the Open pit starting in July 2020.
- The waste rock stockpile is planned to be expanded in September 2020
- The mill site collector pond is schedule to drain to the TMF in September 2020.
- The emergency dump pond drainage area was revised based on work conducted as part of the Erosion and Sedimentation Control Plan (Stantec 2020).





OPEN PIT			
①	—	YEAR 5 DRAINAGE AREA	46.4 ha
②	—	YEAR 5 INFRASTRUCTURE AREA	43.0 ha
③	—	EXISTING DRAINAGE AREA	35.8 ha
④	—	EXISTING WET AREA	0.03 ha

MILL			
⑤	—	YEAR 5 INFRASTRUCTURE AREA	30.7 ha
⑥	—	EXISTING ROM PAD AREA	1.58 ha
⑦	—	EXISTING AND YEAR 5 POND AREA	14.5 ha
⑧	—	EMERGENCY PUMP POND CATCHMENT AREA	1.50 ha
⑱	—	EXISTING AND YEAR 5 COLLECTOR POND CATCHMENT AREA	4.0 ha

SCRAGGY OVERBURDEN STOCKPILE			
⑲	—	YEAR 5 DRAINAGE AREA	10.7 ha
⑳	—	EXISTING DRAINAGE AREA	8.8 ha
㉑	—	2020 WET AREA	0.30 ha

TAILINGS MANAGEMENT FACILITY			
⑨	—	YEAR 5 DRAINAGE AREA	95.7 ha
⑩	—	EXISTING DRAINAGE AREA	103.8 ha
⑪	—	EXISTING WET AREA	34.0 ha

POLISHING POND			
⑫	—	EXISTING AND YEAR 5 DRAINAGE AREA	15.5 ha
⑬	—	EXISTING WET AREA	9.0 ha

WASTE ROCK AREA			
⑭	—	YEAR 5 DRAINAGE AREA	51.4 ha
⑮	—	EXISTING DRAINAGE AREA	43.6 ha
⑯	—	WEST POND	1.07 ha
⑰	—	EAST POND	2.46 ha

THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

Reference:
 DATA SOURCE: DRONE IMAGERY (2019-09-06, 2019-09-28, 2019-09-30, 2019-10-01 & 2019-10-22) PROVIDED BY ATLANTIC MINING NOVA SCOTIA, BING IMAGERY © 2019 DIGITALGLOBE.

WATER BALANCE DRAINAGE AREAS
 TOUQUOY MINE TAILINGS MANAGEMENT FACILITY
 HALIFAX COUNTY, NOVA SCOTIA

Client: ATLANTIC MINING NOVA SCOTIA CORPORATION

Job No.: 121619250
 Scale: AS SHOWN
 Date: 2020 02 27
 Dwn. By: JL
 App'd By: RJ

Fig. No.: 4.2



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4.4 RUNOFF COEFFICIENTS

As noted in Section 4.1, model input runoff coefficients were adjusted to match measured parameters for natural ground, prepared ground and pile/pit/dam or beach surfaces. As summarized in Table 4.2, the runoff coefficient of the waste rock pile to match measured pump volumes to the TMF was 0.05. A higher value of 0.25 was forecasted for the 1:100 year climate condition to account for the increase toe drainage below the pile overtime from wetting.

Table 4.2 Run-off Coefficient

Facility	Natural Ground	Prepared Ground	Pile/Pit/Dam/ Beach
Mill Site	0.67	0.85	0.9
Open Pit		0.75	0.6
Waste Rock and Overburden Piles			0.05 (dry/climate normal), 0.25 (wet)
TMF	0.75	0.85	0.9/0.92*
Polishing Pond	0.67	0.85	0.9
Scraggy Overburden Stockpile		0.85	0.9

Note: * Run-off Coefficient of TMF Dam and wet tailings beach/dry tailings beach

4.5 TMF WATER INFLOW AND OUTFLOW VOLUME FORECAST

The TMF is the receptor for process flows from the mill in addition to pit dewatering, waste rock area drainage, seepage collection ponds, and miscellaneous inputs. Figure 4.3 presents the forecasted water volumes pumped/piped in and out of the TMF for the simulation period. Inflows include water pumped from the pit sump pond, waste rock area collection pond(s), and seepage collection ponds. Outflows include the volume treated in the ETP and process water from the TMF, presented as the net of tailings slurry water volume in the TMF, and the water lock-up and process water demand. For comparison to direct flows in the TMF, the net precipitation (i.e. precipitation less evaporation and seepage losses) is presented in the Figure 4.3. As noted in the Figure, the sum of inflows from the Pit and waste rock collection pond dewatering is comparable to the net precipitation in the TMF.



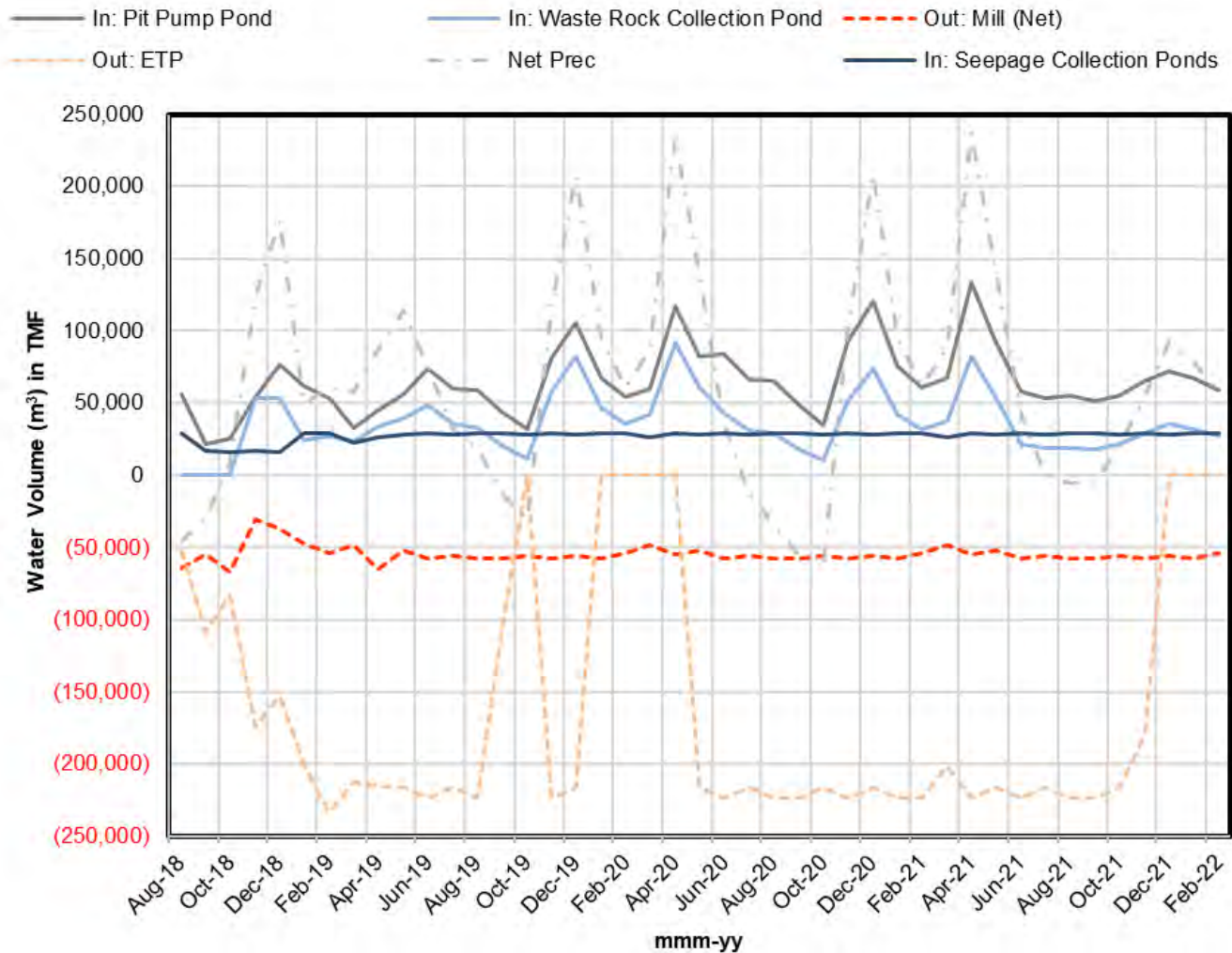


Figure 4.3 Water Volume In and Out of TMF

5.0 TAILINGS DEPOSITION

5.1 EXECUTED TAILINGS DEPOSITION

The executed tailings deposition strategy (date, method, and location) is summarized in Table 5.1 from the July 2018 bathymetry survey to current. Tailings are discharged through a spigot line in the non-frozen months. Tailings are discharged by End-of-Pipe in the frozen months, in areas that are more difficult to access such as off the coffer dam, and in the south-west corner of the TMF as the pumping head was found to be inadequate to meet demand in 2019. Spigot line leak occurred in May and October 2019 where tailings freely flowed from the spigot over the dam embankment into the TMF.



Table 5.1 Executed Tailings Deposition Since July 2018 Bathymetry Survey

Year	Date Start	Date End	Method	Chainage
2018	July 1	September 5	Spigot	0+800 to 1+100
2018	September 5	November 5	Spigot	0+300 to 0+600
2018	November 5	December 17	EOP	Quarry Road (Golder Location 7A)
2018	December 17	December 20	EOP	2+300
2018	December 20	January 11	EOP	2+300
2019	January 11	February 1	EOP	2+300
2019	February 1	March 5	EOP	East Quarry
2019	March 5	May 10	EOP	West Quarry
2019	May 10	June	Line Leak	Leak from 3+110
2019	June	July 15	EOP	1+900
2019	July 15	August 29	EOP	1+400
2019	August 29	September 20	EOP/Spigot	1+450
2019	September 20	October 10	EOP/Spigot	1+600
2019	October 10	October 16	Line Break	2+730
2019	October 16	December 11	EOP	2+297
2019	December 11	January 3	EOP	2+850
2020	January 3	March	EOP	3+000

5.2 BATHYMETRY AND TOPOGRAPHIC SURVEY

As discussed in Section 3, a bathymetry and topographic survey was completed in October 2019, and the most recent survey prior was in July 2018. Further details of the bathymetry and topographic survey can be found in the Heavy Civil Solution (2019) report Tailings Pond Bathymetry and Topographic Survey of Tailings Surface.

Using the survey data and information provided by the Mill, the TMF tailings volumes and densities were calculated and are summarized in Table 5.2. A dry density of 1.407 t/m³ was calculated between July 10 and October 26, 2019, which is less than the original design assumption (2016) of 1.47 t/m³. The design assumption was that the average deposited dry density of tailings in the TMF would increase overtime as layering of tailings in beaching results in consolidation.

Table 5.2 Summary of TMF Tailings Volumes and Tonnage

Deposition Period	Surveyed Volume (m ³)	Mill Throughput Records (t)	Calculated Density (t/m ³)
Startup (TMF Base) to July 10, 2018	1,008,000	1,410,831	1.400
July 10, 2018 to October 26, 2019	2,114,366	2,973,863	1.407
Total Deposited Tailings Startup (TMF Base) to October 26 2019	3,122,366	4,384,694	1.404



WATER BALANCE REVISION #13

The 2019 survey shows variations in the slope of the tailings surface throughout the TMF with an average slope of 0.5% above the 119.5 m elevation and 1.75% below the 119.5 m elevation. The difference in average slope grades of 0.5% and 1.75% is primarily controlled by the difference in subaerial and subaqueous tailings deposition. These flatter slopes are formed during the low water level in the summer and were observed, in both the 2018/2019 surveys, to remain after the water level rises the following winter and spring months. This inflection point below the water line is illustrated in Figure 5.6. The range in tailings deposition slopes measured in the 2019 survey is illustrated in Figure 5.7.

In reference to the original design, tailings slopes were assumed to be at 1% for subaerial deposition (i.e. beached) and 3% for subaqueous. In addition, the design assumed that the average deposited dry density of tailings in the TMF would increase overtime as provided in Table 2. However, based on the results of the recent survey, we note that both the overall slopes and deposited dry densities are lower than that assumed in the original design. These differences may be attributed to the method of tailings deposition through end of pipe, as opposed to spigotting. What was observed in the 2019 surveyed tailings slope including the below water line inflection point were carried forward in simulating future tailings deposition.

5.3 TAILINGS DEPOSITION STRATEGY

The tailings deposition plan followed a similar strategy to the Golder (2019) deposition plan for the location and timing of tailings deposition. The tailings deposition strategy is to maintain the tailings beach elevation above the pond elevation radially, to reduce free water ponding next to the dam and resultingly also reducing seepage. Therefore, following each dam raise the tailings should be spigotted radially along the TMF crest. This approach is in accordance with assumptions of seepage and slope stability predictions modelled by Stantec during the design phase. Consistent dry beach deposition was another assumption of the Stantec design to meet volume requirements of the facility. A TMF raise is planned for the construction seasons of 2020 and 2021, and therefore tailings should be deposited radially during both years. An annual bathymetry survey should be conducted to further optimize the tailings deposition strategy and update model forecast.

Table 5.3 presents the Tailings Deposition Plan between October 2019 to March 2022. For completeness, the table also includes executed tailings deposition from the past bathymetry survey in July 2018. The table summarizes the general deposition area and TMF chainage by month to achieve the tailings deposition objectives. For each month of tailings production, the resultant tailings beach elevation and cumulative tailings volume was estimated.



WATER BALANCE REVISION #13

Table 5.3 Tailings Deposition Plan

Year	End of Month	Deposition Area	Deposition Method	Chainage	Beach Elev. (m)	Tailings Produced (t)	Tailings Volume (m ³)	Cum. Tailings Volume (m ³)	Storage Remaining (m ³)
2018	Jul	South/West, West	Spigot	0+800 to 1+100	121	196,069	139,402	1,109,619	
2018	Aug		Spigot		121	190,759	135,627	1,245,246	
2018	Sep		Spigot	0+300-0+600	121	194,301	138,144	1,383,390	
2018	Oct		Spigot		121	184,952	131,497	1,514,887	
2018	Nov	Quarry Road	EOP	Location 7A	121	161,323	114,698	1,629,585	
2018	Dec	East	EOP	2+300	121	194,628	138,377	1,767,963	
2019	Jan		EOP		121	176,254	125,314	1,893,277	
2019	Feb	TMF Quarry - East Lobe	EOP	2+800 to 3+000	120	152,272	108,263	2,001,539	
2019	Mar	TMF Quarry - West Lobe	EOP	3+000 to 3+100	120	199,424	141,787	2,143,326	
2019	Apr		EOP		120.3	203,122	144,416	2,287,743	
2019	May	TMF Quarry	Leak	3+100	120.3	213,683	151,925	2,439,668	
2019	Jun	East	EOP	1+900	121	194,286	138,134	2,577,802	
2019	Jul	South	EOP	1+400	121	216,672	154,050	2,731,852	
2019	Aug	South	EOP/Spigot*	1+400	121	192,358	136,763	2,868,615	
2019	Sep	South	EOP/Spigot*	1+450	122.2	168,233	119,611	2,988,226	
2019	Oct	North, North/East	EOP	2+730, 2+297	122.0	237,001	168,504	3,156,729	4,601,266
2019	Nov	North, North/East	EOP	2+297	122	190,392	135,318	3,292,047	4,465,949
2019	Dec	North	EOP	2+850	122.3	209,204	148,688	3,440,735	4,317,261
2020	Jan	North	EOP	2+850, 3+000	123.6	227,503	161,694	3,602,429	4,155,567
2020	Feb		EOP		124.1	210,000	149,254	3,751,682	4,006,313
2020	Mar		Spigot	3+000	124.5	232,500	165,245	3,916,928	3,841,068
2020	Apr	West	Spigot	0+900 to 0+600	123.3	225,000	159,915	4,076,842	3,681,153
2020	May		Spigot		123.8	232,500	165,245	4,242,088	3,515,908
2020	Jun	West	Spigot	0+ 800 to 0+600	124.0	225,000	159,915	4,402,002	3,355,994
2020	Jul		Spigot	0+400 to 0+300	124.4	232,500	165,245	4,567,248	3,190,748
2020	Aug	North	Spigot		125.4	232,500	165,245	4,732,493	3,025,503



WATER BALANCE REVISION #13

Table 5.3 Tailings Deposition Plan

Year	End of Month	Deposition Area	Deposition Method	Chainage	Beach Elev. (m)	Tailings Produced (t)	Tailings Volume (m ³)	Cum. Tailings Volume (m ³)	Storage Remaining (m ³)
2020	Sep		Spigot	3+150 to 3+050, 2+800 to 2+700	125.4	225,000	159,915	4,892,407	2,865,588
2020	Oct		Spigot		125.4	232,500	165,245	5,057,653	2,700,343
2020	Nov	East	Spigot	2+300 to 2+200, 2+100 to 2+000	125.5	225,000	159,915	5,217,567	2,540,429
2020	Dec		EOP		125.5	232,500	165,245	5,382,813	2,375,183
2021	Jan		EOP		125.5	232,500	165,245	5,548,058	2,209,938
2021	Feb	South	EOP	1+800,1+700, 1+600 to 1+500, 1+400 to 1+300	126.2	210,000	149,254	5,697,311	2,060,684
2021	Mar		Spigot		126.2	232,500	165,245	5,862,557	1,895,439
2021	Apr		Spigot		126.2	225,000	159,915	6,022,471	1,735,524
2021	May	West	Spigot	0+600 to 0+500, 0+400 to 0+300	126.8	232,500	165,245	6,187,717	1,570,279
2021	Jun		Spigot		126.8	225,000	159,915	6,347,631	1,410,365
2021	Jul		Spigot		126.8	232,500	165,245	6,512,877	1,245,119
2021	Aug	West/North West	Spigot	0+200 to 0+100, 0+000 to 3+300, 3+200 to 3+000	128.0	232,500	165,245	6,678,122	1,079,874
2021	Sep		Spigot		128.0	225,000	159,915	6,838,036	919,959
2021	Oct		Spigot		128.0	232,500	165,245	7,003,282	754,714
2021	Nov	North/East	Spigot	2+900 to 2+800, 2+700, 2+600, 2+500, 2+400, 2+300, 2+200, 2+100, 2+000, 1+900, 1+800, 1+700	128.0	225,000	159,915	7,163,196	594,800
2021	Dec		EOP		128.0	232,500	165,245	7,328,442	429,554
2022	Jan		EOP		128.0	232,500	165,245	7,493,687	264,309
2022	Feb	South	EOP	1+600 to 1+100	128.0	210,000	149,254	7,642,940	115,055
2020	March	South/West	EOP	1+000 to 0+400	128.0	115,055	115,060	7,758,000	0
Design LOM Tailings Volume (m³) = 6,326,530					Highlighted Denotes Ultimate TMF Capacity (m³)				



WATER BALANCE REVISION #13

Figures 5.1 to 5.4 presents modelled tailings and water elevation and volume from the October 2019 bathymetry survey until the TMF reaches the final or ultimate storage capacity.

The tailings deposition plan requires spigot and pipeline locations to consistently move along the dam perimeter to radially accrete the tailings beach, rather than one location over a longer period of time that may result in more seepage through the dam. Past executed tailings deposition strategies did not achieve this radial accretion of tailings beach annually. For example, tailings were not deposited on the west side of the TMF from August 2018 until April 2020 and tailings were not deposited in the south in 2020.

5.4 TMF MINIMUM WATER DEPTH

Based on modeled tailings slopes, sub-aqueous tailings deposition could extend laterally to the decant area, resulting in low water depths (under 2 m) around the barge. If possible, increasing the thickness of the tailings slurry is likely to increase beach slopes and reduce the lateral extent of deposited tailings. In addition, tailings should be spigotted from at least 50 cm above the top of beach elevation where possible. Dredging around the barge may be required in 2021 to maintain adequate water depth to operate the barge.

As the ETP is not planned to operate 4 months in the winter, management of water levels in the TMF will be operated higher in these months. This will create additional sub-aqueous tailings deposition as opposed to beaching, and result in tailings to travel further linearly and lowering water depths in the pond.

Figure 5.5 presents contours of the water depth in the TMF over time for selected months. The Figures show a snapshot in time as the pond volume in the TMF ranges over the operating range of the pond. Both high and low operating levels are presented.

5.5 TMF AVAILABLE STORAGE CAPACITY

The estimated available storage capacity of the TMF assuming the original design case of top of tailings beach at 128.0 m is provided in Table 5.4 and further in MEM-138-900.300-D-21APR20. The results show a slight increase in capacity compared to the original design assumptions primarily due to tailings surface geometry and other modifications and changes inside the TMF footprint.

The water volume in the pond is anticipated to vary during operation month by month, based on climate conditions, water requirements and operation of the effluent treatment plant. Generally, this volume varies from approximately 400,000 m³ to 1,000,000 m³ of water storage. This variance is incorporated into the storage capacity volume estimates below.

The ultimate TMF footprint tailings and water contours are presented in Figure 5.6, side by side for the minimum water storage and maximum water storage volumes. Normal operating water levels in the TMF above 128.0 m would result in normal water levels higher than designed, thus requiring additional seepage modelling and or slope stability modelling prior to any designed increase. Therefore, TMF ultimate capacity is based on a maximum water volume of 850,000 m³.



WATER BALANCE REVISION #13

Table 5.4 Summary of TMF Available Storage Capacity (Max Tailings Elev. 128.0m)

Assumptions	Available Storage
<u>Original Design Case 2016/2017</u> <ul style="list-style-type: none"> Refer to Table 3.1 1 M m³ of water storage, resulting in high normal operating water level = 125.8 m 	<p align="center">6,426,000 m³ (Using 1.47 t/m³ = 9,446,220 t)</p>
<u>Based on 2018 Bathymetric Survey and Water Balance Rev. 12</u> <ul style="list-style-type: none"> Tailings slope of 1% above water and 3% below 1 M m³ of water storage, resulting in high normal operating water level = 127.0 m 	<p align="center">6,688,000 m³ (Using 1.47 t/m³ = 9,831,360 t)</p>
<u>Based on 2019 Bathymetric Survey and Water Balance Rev. 13^{2 & 3}</u> <ul style="list-style-type: none"> Tailings slope of 0.5% above water and 1.75% below Maximum water elevation at 128.0 m, results in a maximum of 850,000 m³ water storage Refer to Figure 5.6. 	<p align="center">7,758,000 m³ (Using 1.41 t/m³ = 10,938,078 t) (Using 1.40 t/m³ = 10,861,200 t)</p>

Notes:

- Volumes have been rounded for this table to the nearest 1,000 m³
- In order to contain one IDF below the spillway invert elevation, the maximum operating water level of 128.0 was used. In order to maintain this maximum water level, adjustment to the ETP operation schedule may be required during the final months of operation.
- The ultimate capacity reported based on the 2019 survey does not account for the recommended minimum of 0.5 m of storage to allow for model uncertainty and potential changes in assumptions of tailings deposition.

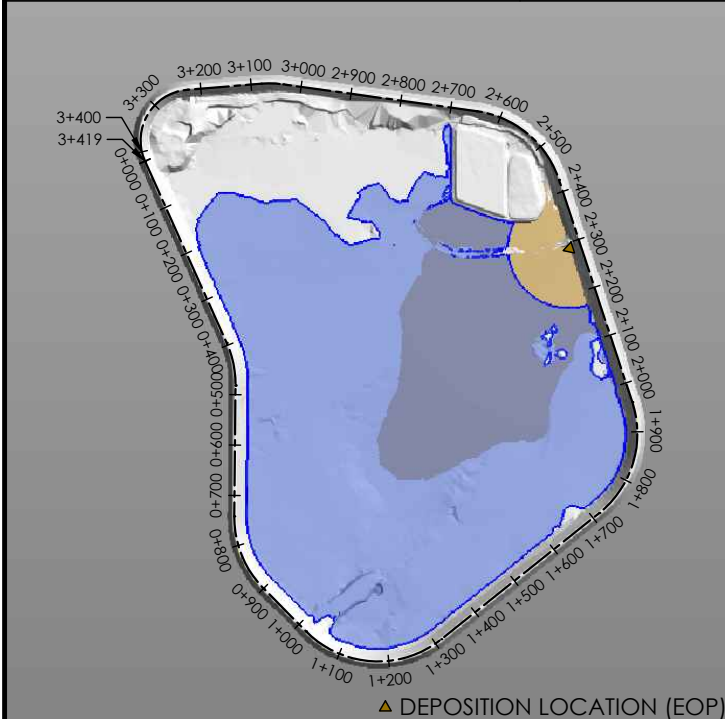
Using the results of the 2019 bathymetry survey the remaining available storage in the TMF as of October 26, 2019 is as follows (values rounded to the nearest 1,000):

- Ultimate Capacity (Table 3) = 7,758,000 m³
- Used (Surveyed Placed Volume (Table 2) = 3,122,000 m³
- Available = **4,636,000 m³**



OCTOBER 26, 2019 TO NOVEMBER 30, 2019

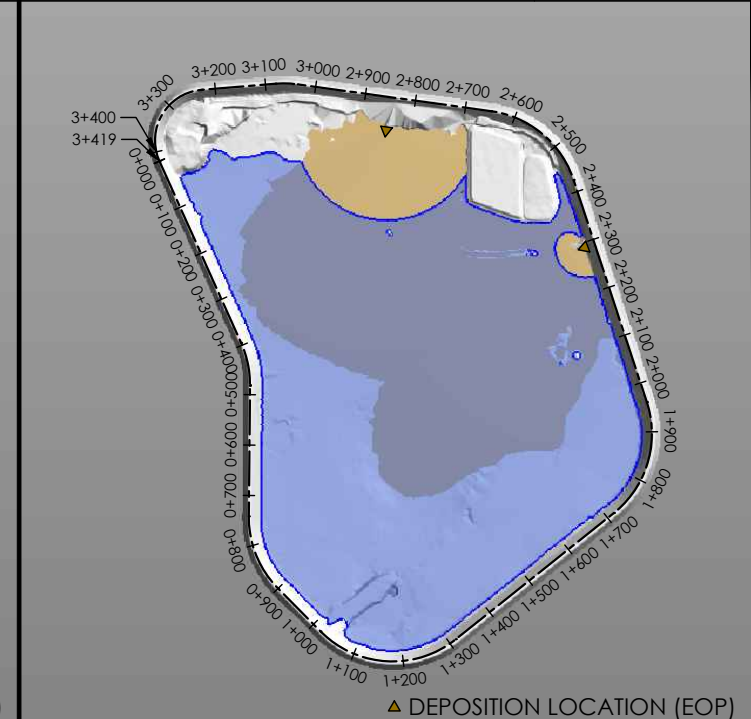
MINIMUM TAILINGS DEPOSITION ELEVATION	122.0 m
TAILINGS VOLUME	167,644 m ³
WATER VOLUME	762,596 m ³
WATER ELEVATION	121.4 m



▲ DEPOSITION LOCATION (EOP)

DECEMBER 1-31 2019

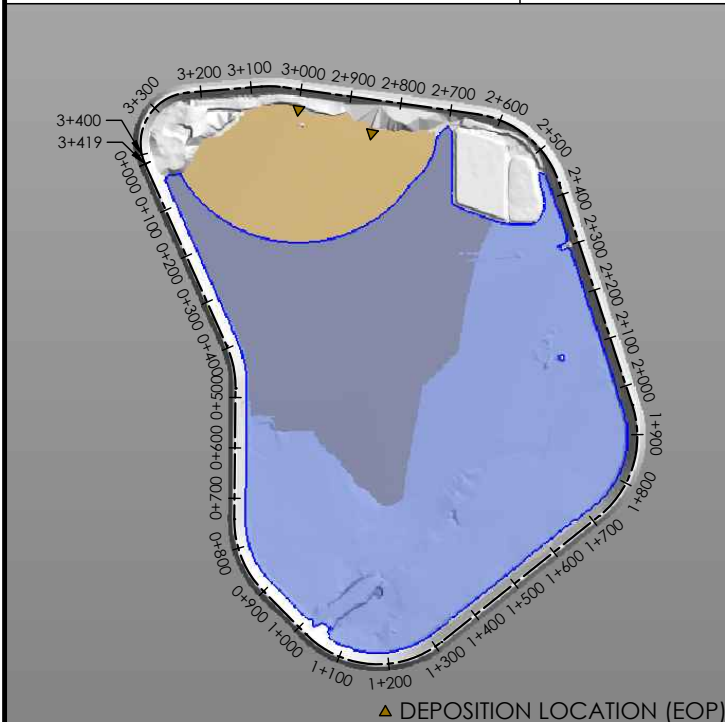
MINIMUM TAILINGS DEPOSITION ELEVATION	122.3 m
TAILINGS VOLUME	148,688 m ³
WATER VOLUME	921,439 m ³
WATER ELEVATION	121.9 m



▲ DEPOSITION LOCATION (EOP)

JANUARY 1-31, 2020

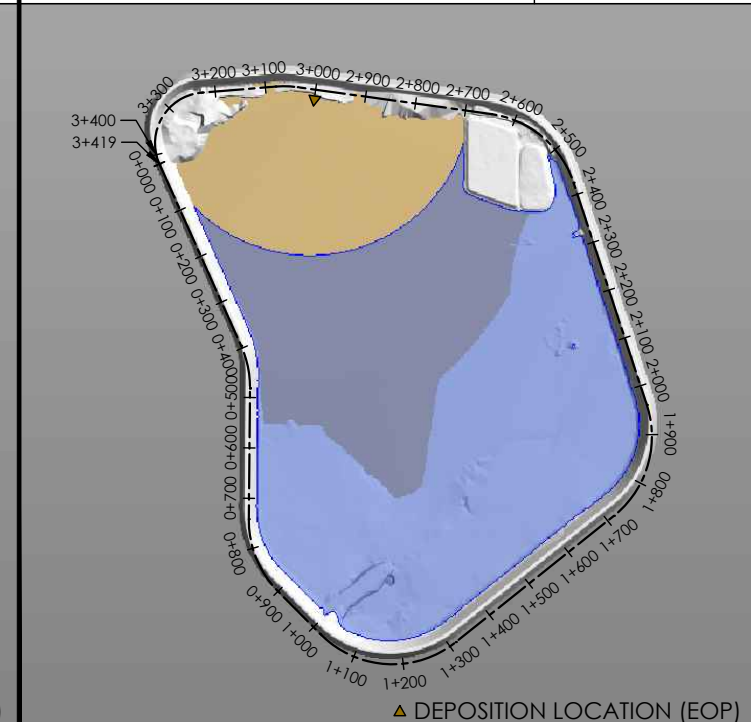
MINIMUM TAILINGS DEPOSITION ELEVATION	123.6 m
TAILINGS VOLUME	161,694 m ³
WATER VOLUME	972,410 m ³
WATER ELEVATION	122.3 m



▲ DEPOSITION LOCATION (EOP)

FEBRUARY 1-29, 2020

MINIMUM TAILINGS DEPOSITION ELEVATION	124.1 m
TAILINGS VOLUME	149,254 m ³
WATER VOLUME	1,015,599 m ³
WATER ELEVATION	122.5 m



▲ DEPOSITION LOCATION (EOP)

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TAILINGS DEPOSITION AND WATER LEVELS
OCTOBER 2019 TO FEBRUARY 2020
 TOUQUOY MINE TAILINGS MANAGEMENT FACILITY
 HALIFAX COUNTY, NOVA SCOTIA

Client: ATLANTIC MINING NS CORP

Job No.: 121619250
Scale: N.T.S.
Date: 2020 04 09
Dwn. By: JL
App'd By: RJ

Fig. No.: 5.1



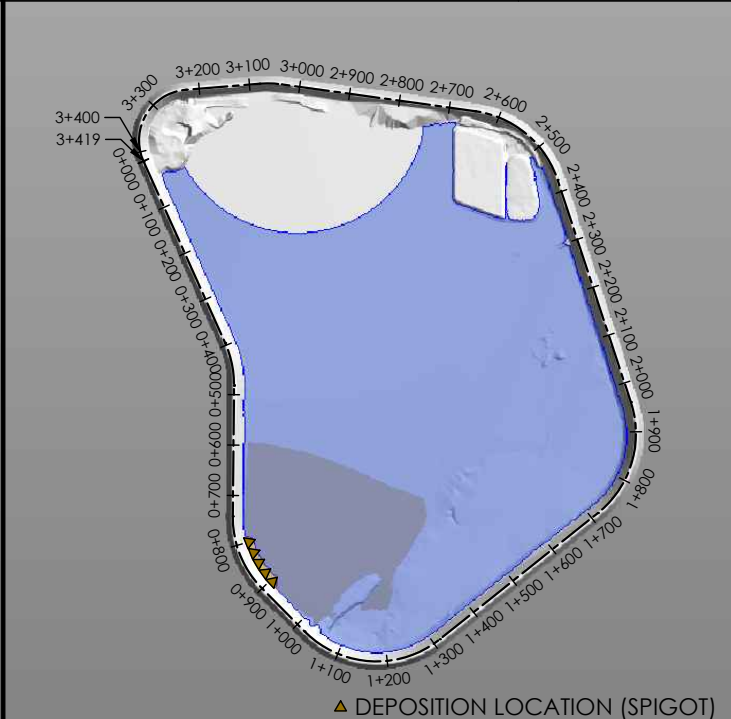
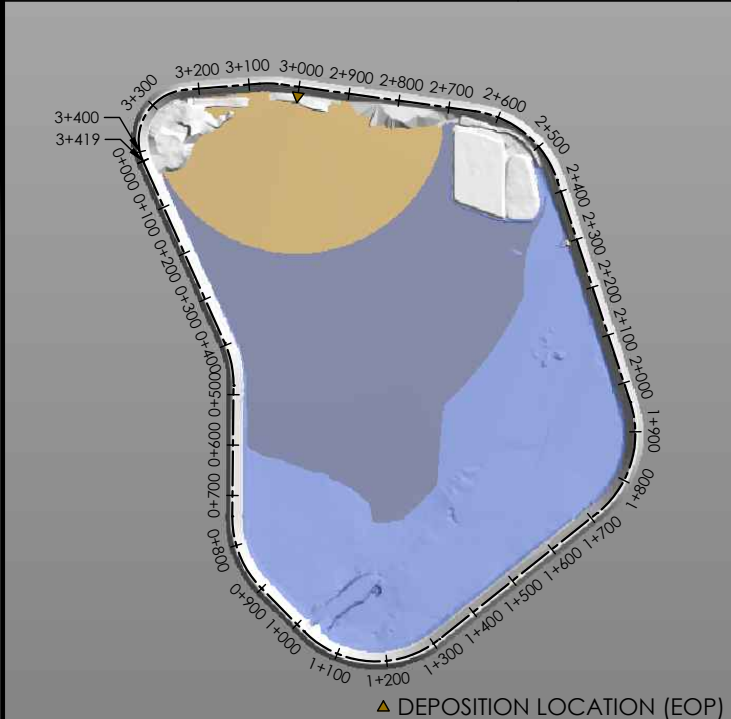
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MARCH 1-31, 2020

APRIL 1-30, 2020

MINIMUM TAILINGS DEPOSITION ELEVATION	124.5 m
TAILINGS VOLUME	165,245 m ³
WATER VOLUME	1,170,053 m ³
WATER ELEVATION	123.0 m

MINIMUM TAILINGS DEPOSITION ELEVATION	123.3 m
TAILINGS VOLUME	159,915 m ³
WATER VOLUME	1,127,107 m ³
WATER ELEVATION	123.2 m



▲ DEPOSITION LOCATION (EOP)

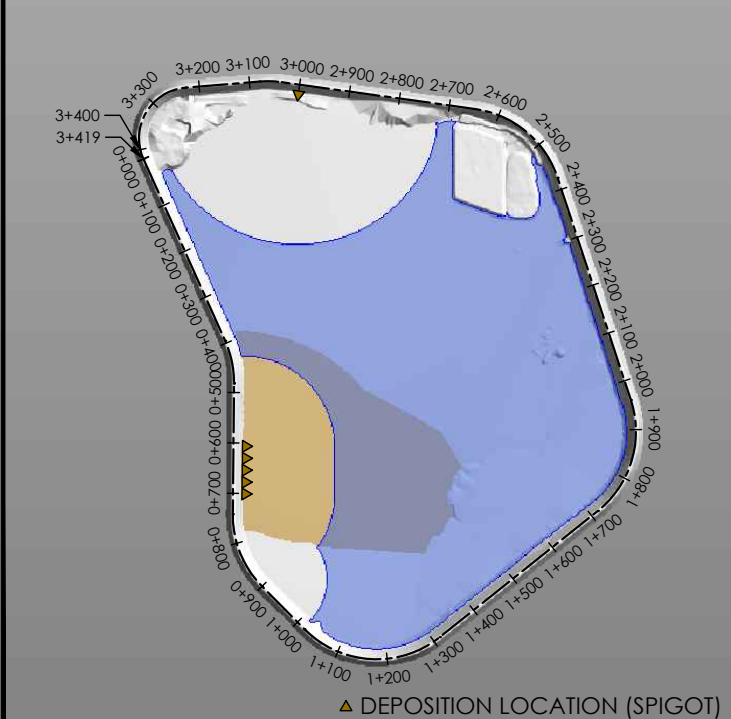
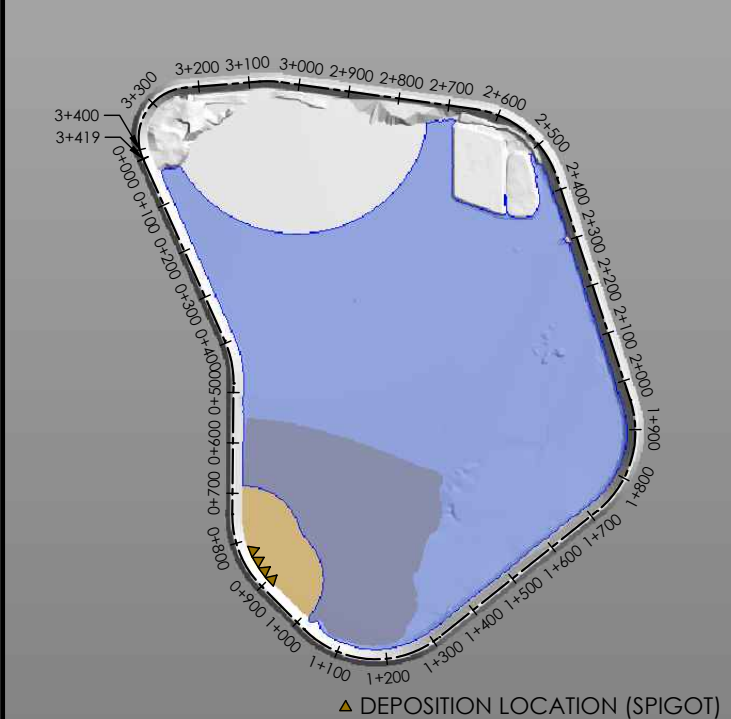
▲ DEPOSITION LOCATION (SPIGOT)

MAY 1-31, 2020

JUNE 1-30, 2020

MINIMUM TAILINGS DEPOSITION ELEVATION	123.8 m
TAILINGS VOLUME	165,245 m ³
WATER VOLUME	942,698 m ³
WATER ELEVATION	123.2 m

MINIMUM TAILINGS DEPOSITION ELEVATION	124.0 m
TAILINGS VOLUME	159,915 m ³
WATER VOLUME	738,349 m ³
WATER ELEVATION	123.1 m



▲ DEPOSITION LOCATION (SPIGOT)

▲ DEPOSITION LOCATION (SPIGOT)

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TAILINGS DEPOSITION AND WATER LEVELS
MARCH 2020 TO JUNE 2020
 TOUQUOY MINE TAILINGS MANAGEMENT FACILITY
 HALIFAX COUNTY, NOVA SCOTIA

Job No.: 121619250
Scale: N.T.S.
Date: 2020 04 09
Dwn. By: JL
App'd By: RJ

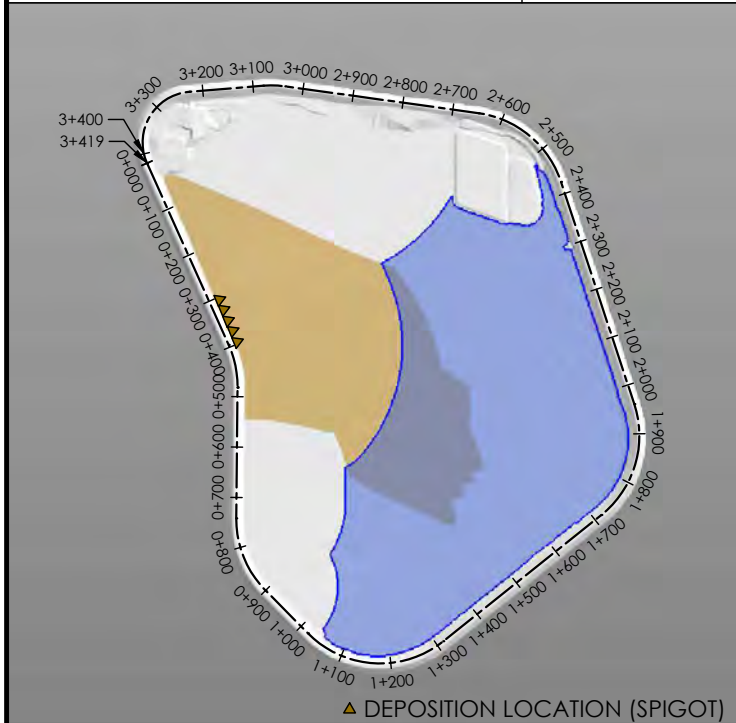
Fig. No.: 5.2



Client: ATLANTIC MINING NS CORP

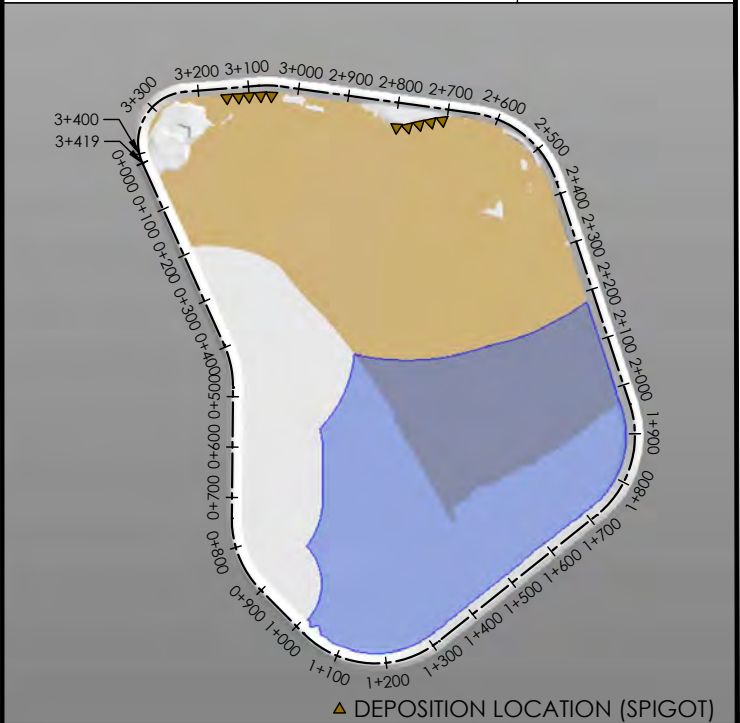
JULY 1-31, 2020

MINIMUM TAILINGS DEPOSITION ELEVATION	124.4 m
TAILINGS VOLUME	165,245 m ³
WATER VOLUME	515,135 m ³
WATER ELEVATION	122.8 m



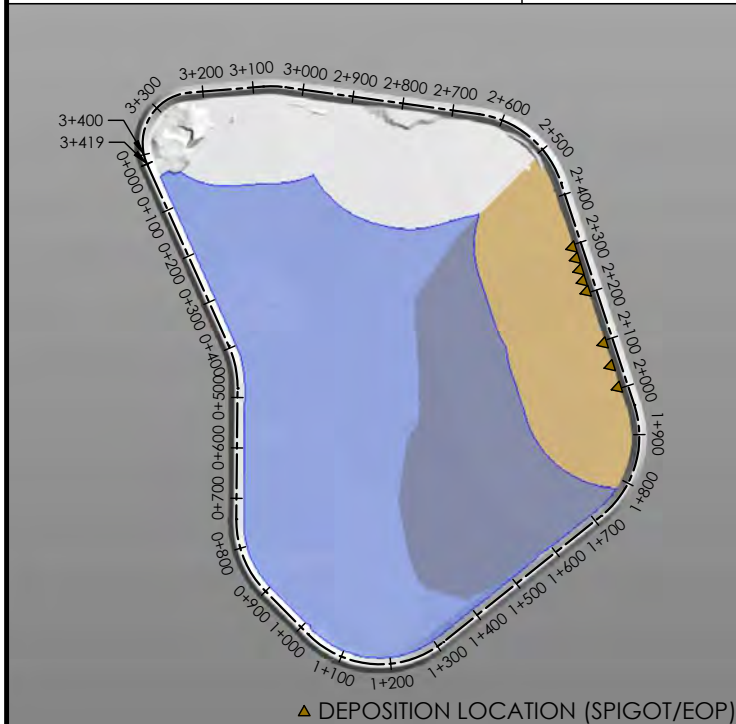
AUGUST 1 - OCTOBER 31, 2020

MINIMUM TAILINGS DEPOSITION ELEVATION	125.4 m
TAILINGS VOLUME	490,405 m ³
WATER VOLUME	440,000 m ³
WATER ELEVATION	123.2 m



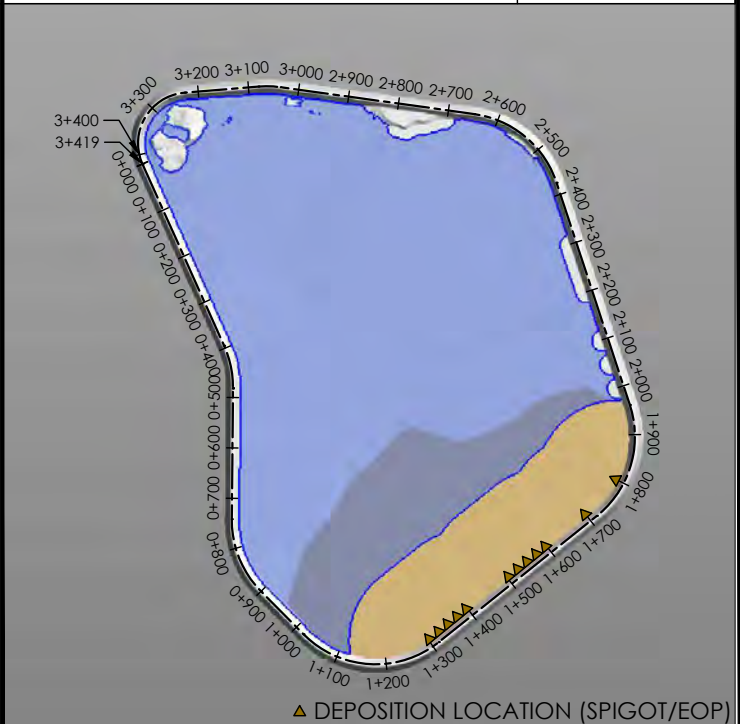
NOVEMBER 1, 2020 - JANUARY 31, 2021

MINIMUM TAILINGS DEPOSITION ELEVATION	125.5 m
TAILINGS VOLUME	490,405 m ³
WATER VOLUME	576,030 m ³
WATER ELEVATION	124.5 m



FEBRUARY 1-APRIL 30, 2021

MINIMUM TAILINGS DEPOSITION ELEVATION	126.2 m
TAILINGS VOLUME	474,414 m ³
WATER VOLUME	680,530 m ³
WATER ELEVATION	125.4 m



THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

TAILINGS DEPOSITION AND WATER LEVELS
JULY 2020 TO APRIL 2021
 TOUQUOY MINE TAILINGS MANAGEMENT FACILITY
 HALIFAX COUNTY, NOVA SCOTIA

Client: ATLANTIC MINING NS CORP

Job No.: 121619250
Scale: N.T.S.
Date: 2020 04 09
Dwn. By: JL
App'd By: RJ

Fig. No.: 5.3

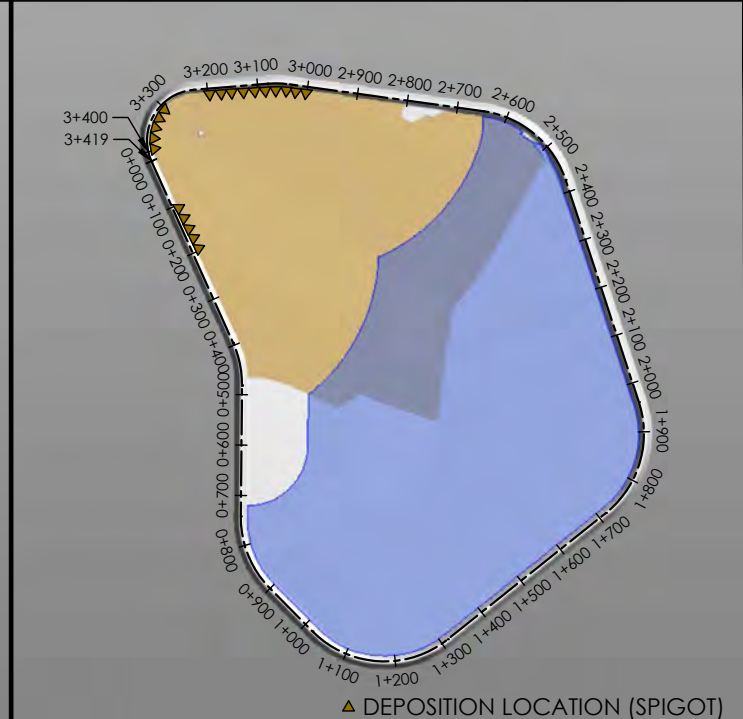
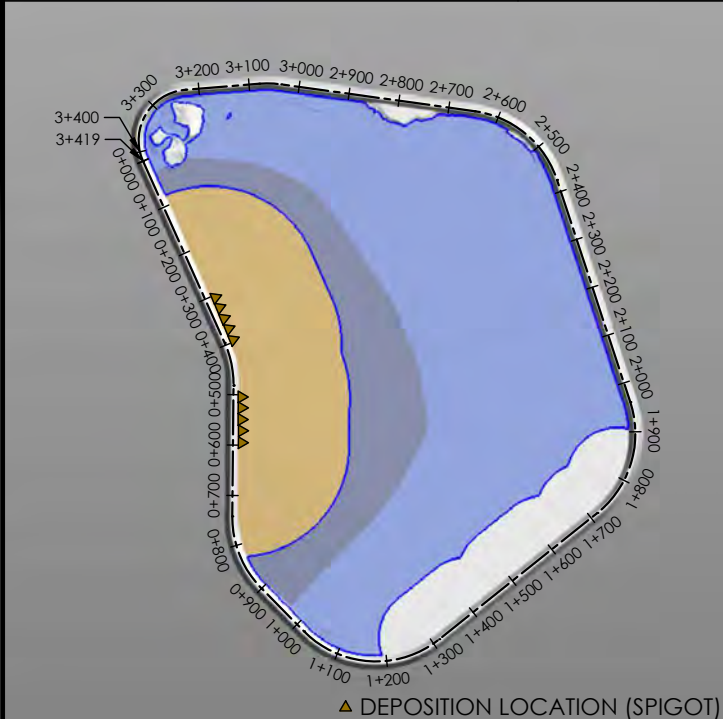


MAY 1 - JULY 31, 2021

AUGUST 1 - OCTOBER 31, 2021

MINIMUM TAILINGS DEPOSITION ELEVATION	126.8 m
TAILINGS VOLUME	490,405 m ³
WATER VOLUME	440,000 m ³
WATER ELEVATION	125.7 m

TAILINGS DEPOSITION ELEVATION	128.0 m
TAILINGS VOLUME	490,405 m ³
WATER VOLUME	440,000 m ³
WATER ELEVATION	125.9 m



▲ DEPOSITION LOCATION (SPIGOT)

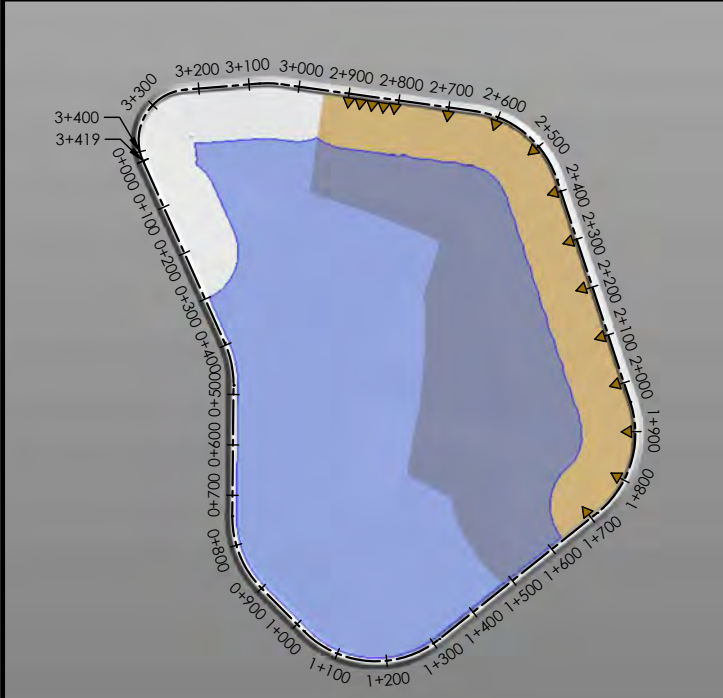
▲ DEPOSITION LOCATION (SPIGOT)

NOVEMBER 1, 2021 - JANUARY 31, 2022

FINAL

TAILINGS DEPOSITION ELEVATION	128.0 m
TAILINGS VOLUME	490,405 m ³
WATER VOLUME	730,575 m ³
WATER ELEVATION	127.5 m

TAILINGS DEPOSITION ELEVATION	128.0 m
TAILINGS VOLUME	260,000 m ³
WATER VOLUME	440,000 m ³
WATER ELEVATION	127.3 m



▲ DEPOSITION LOCATION (SPIGOT/EOP)

▲ DEPOSITION LOCATION (SPIGOT/EOP)

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TAILINGS DEPOSITION AND WATER LEVELS
JULY 2021 TO FINAL
 TOUQUOY MINE TAILINGS MANAGEMENT FACILITY
 HALIFAX COUNTY, NOVA SCOTIA

Job No.: 121619250
Scale: N.T.S.
Date: 2020 04 09
Dwn. By: JL
App'd By: RJ

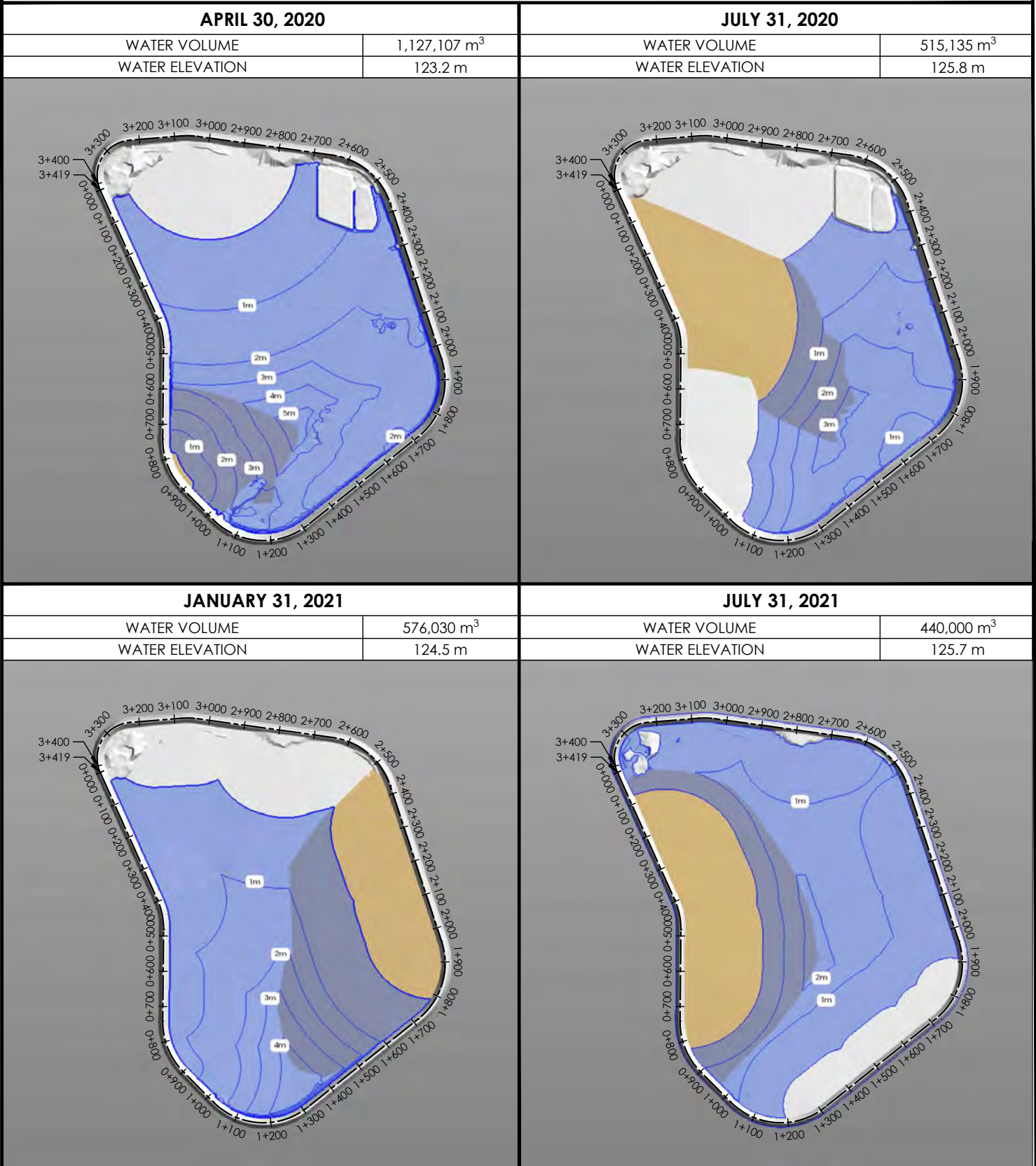
Fig. No.: 5.4



Client: ATLANTIC MINING NS CORP

NOTES:

1. WATER DEPTH CONTOURS ARE SHOWN FOR DISCUSSION PURPOSES ONLY WITH REGARDS TO BARGE LOCATION AND THE POTENTIAL NEED FOR DREDGING.
2. CONTOURS ARE APPROXIMATE AND ARE BASED ON TAILINGS 3D MODELING SCENARIOS (USING MUCK3D TAILINGS +).



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WATER DEPTH CONTOURS
 TOUQUOY MINE TAILINGS MANAGEMENT FACILITY
 HALIFAX COUNTY, NOVA SCOTIA

Client: ATLANTIC MINING NS CORP

Job No.:	121619250
Scale:	N.T.S.
Date:	2020 04 09
Dwn. By:	JL
App'd By:	RJ

Fig. No.: 5.5



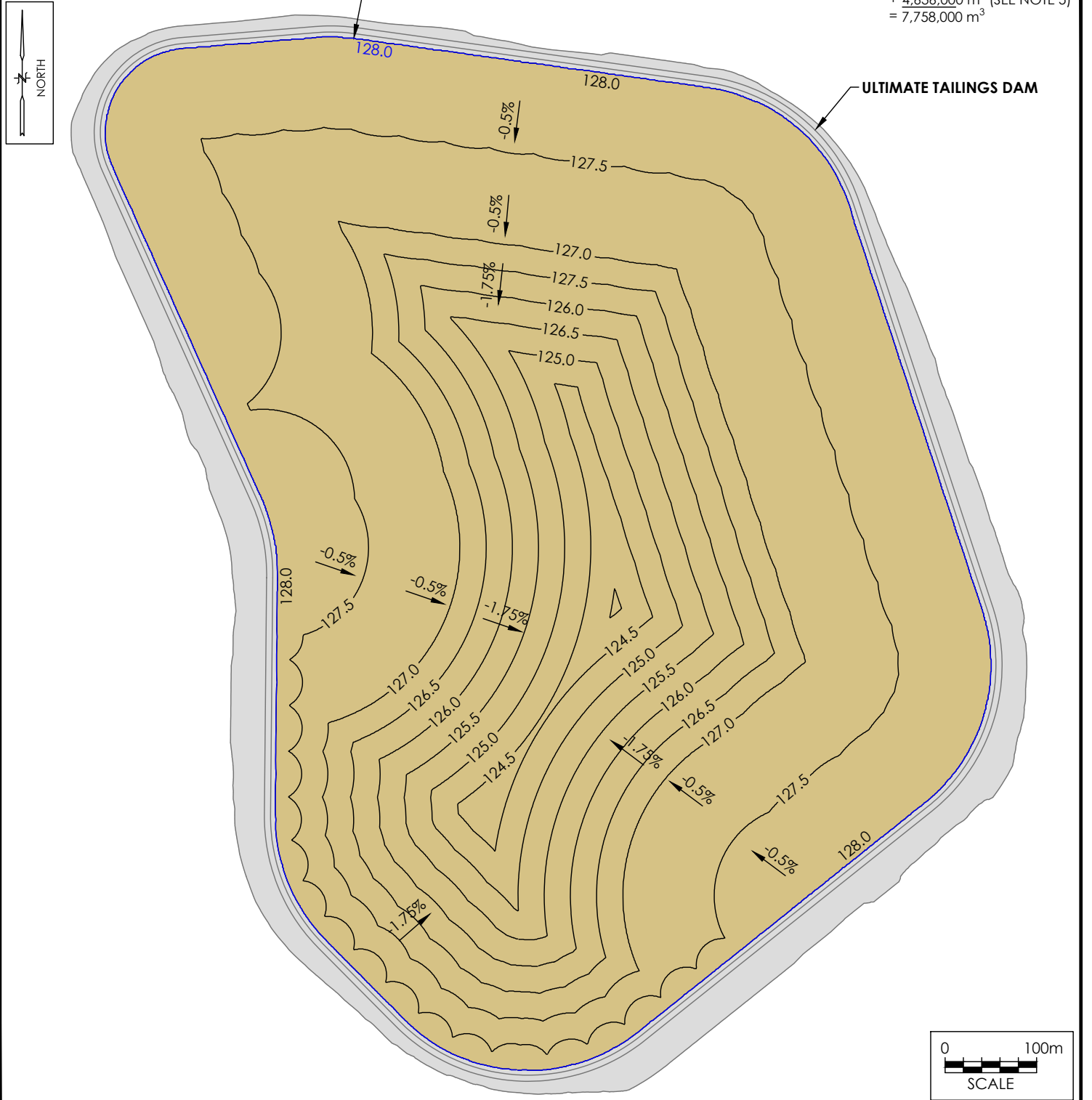
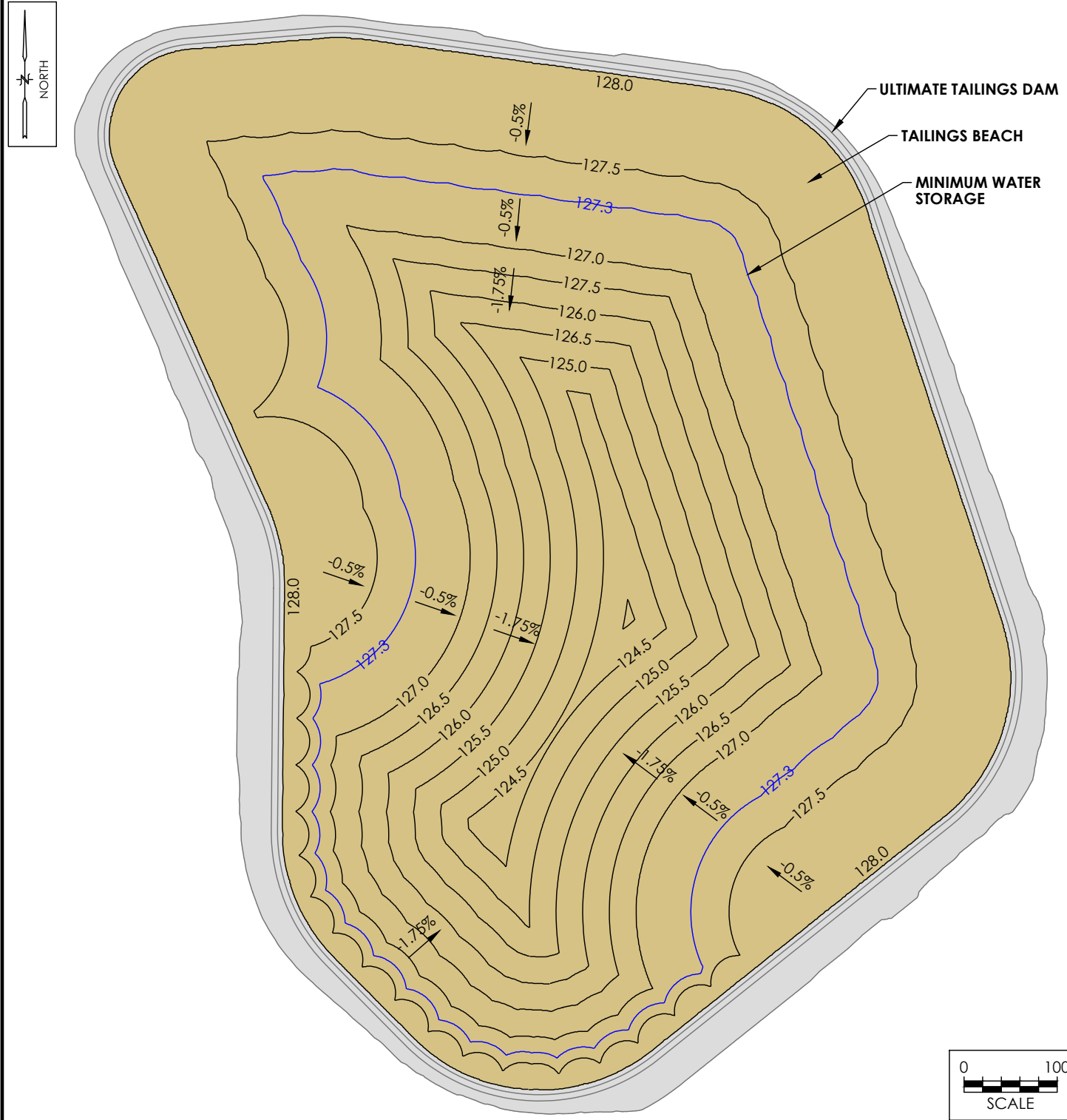
C:\Users\jlockhart\Desktop\WORK\04_TOUQUOY\16_WBAL\C19250-WBAL-RV13-FIG-5.5.dwg

NOTES:

1. ABOVE WATER TAILINGS BEACH SLOPE (-0.5% AVERAGE) BASED ON LASER SCAN OF EXPOSED TAILINGS (HEAVY CIVIL SOLUTIONS INC.; OCTOBER 21-26, 2019).
2. SUBMERGED TAILINGS BEACH SLOPE (-1.75% AVERAGE) BASED ON 2019-10-26 BATHYMETRY SURVEY (HEAVY CIVIL SOLUTIONS INC.; OCTOBER 21-26, 2019).
3. ANALYSIS OF AERIALS AND TAILINGS SURVEYS INDICATED THAT ONCE A TAILINGS BEACH WAS COVERED WITH WATER IT DID NOT A CHANGE OF ORIGINAL SLOPE.
4. TAILINGS PLACED AS OF OCTOBER 26, 2019 BASED ON BATHYMETRY SURVEY.
5. TAILINGS DEPOSITION MODELING DONE USING MUCK 3D TO DETERMINE STORAGE AVAILABLE BETWEEN OCTOBER 26, 2019 AND MAX. TAILINGS STORAGE CAPACITY: 4,636,000 m³.

TOTAL TMF TAILINGS STORAGE	7,758,000 m ³
MAXIMUM TAILINGS ELEVATION	128.0 m
MINIMUM WATER STORAGE VOLUME	440,000 m ³
MINIMUM WATER STORAGE ELEVATION	127.3 m
MAXIMUM WATER STORAGE VOLUME	850,000 m ³
MAXIMUM WATER STORAGE ELEVATION	128.0 m

TOTAL TMF TAILINGS STORAGE: 3,122,000 m³ (SEE NOTE 4)
 + 4,636,000 m³ (SEE NOTE 5)
 = 7,758,000 m³



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THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

Reference:
-

TMF ULTIMATE TAILINGS PROJECTION
 TOUQUOY MINE TAILINGS MANAGEMENT FACILITY
 HALIFAX COUNTY, NOVA SCOTIA

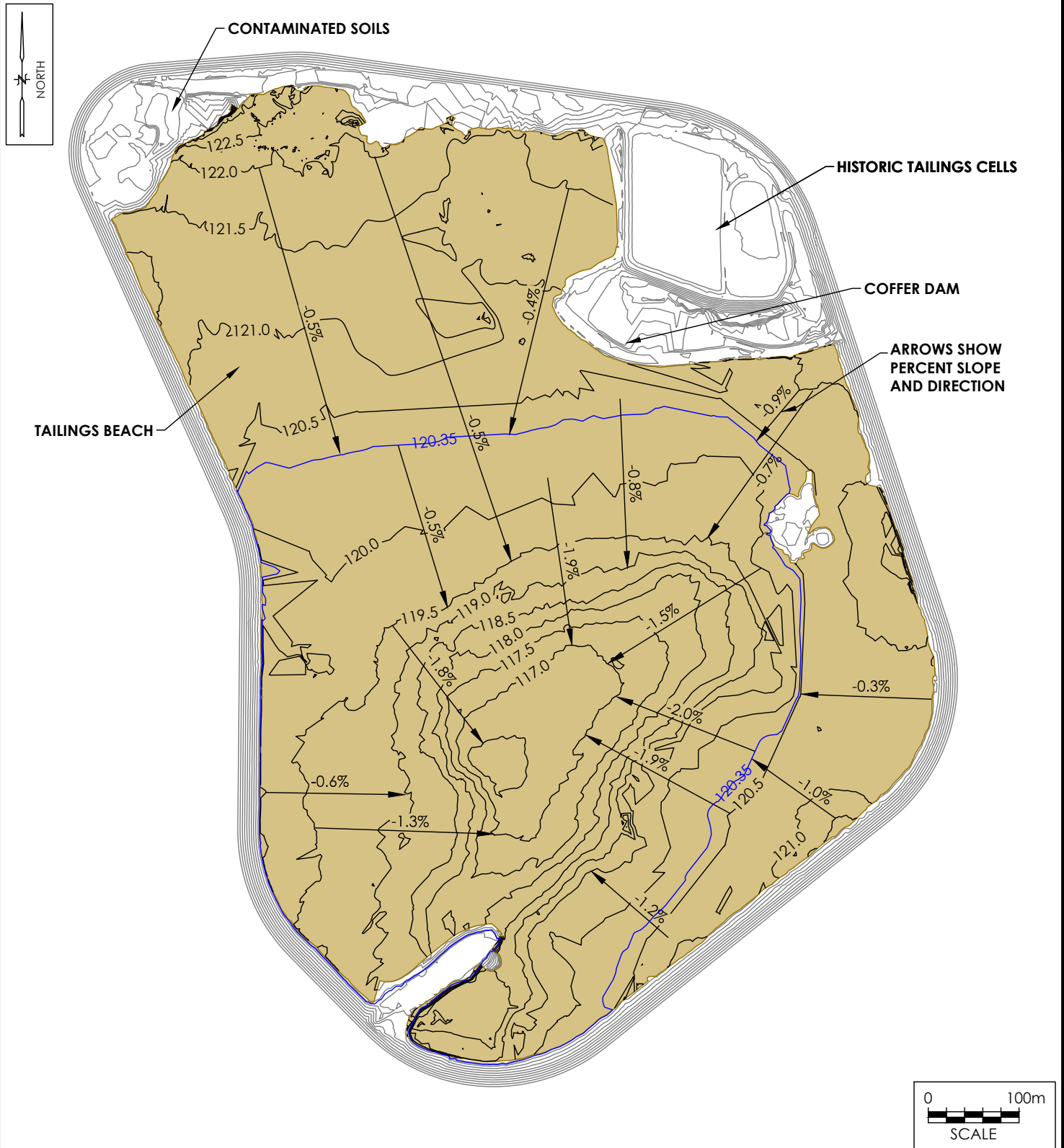
Client: ATLANTIC MINING NS CORP

Job No.: 121619250
Scale: 1 : 6000
Date: 2020 04 09
Dwn. By: JL
App'd By: RJ

Fig. No.: 5.6

NOTES:

1. ABOVE WATER TAILINGS BEACH SLOPE (-0.5% AVERAGE) BASED ON LASER SCAN OF EXPOSED TAILINGS (HEAVY CIVIL SOLUTIONS INC.; OCTOBER 21-26, 2019).
2. SUBMERGED TAILINGS BEACH SLOPE (-1.75% AVERAGE) BASED ON 2019-10-26 BATHYMETRY SURVEY (HEAVY CIVIL SOLUTIONS INC.; OCTOBER 21-26, 2019).
3. ANALYSIS OF AERIALS AND TAILINGS SURVEYS INDICATED THAT ONCE A TAILINGS BEACH WAS COVERED WITH WATER IT DID NOT RESULT IN A CHANGE IN SLOPE.



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OCTOBER 2019 TAILINGS SURVEY
 TOUQUOY MINE TAILINGS MANAGEMENT FACILITY
 HALIFAX COUNTY, NOVA SCOTIA

Job No.: 121619250

Scale: 1 : 6000

Date: 2020 04 09

Dwn. By: JL

App'd By: PD

Figure No.: **5.7**



Client: ATLANTIC MINING NS CORP

6.0 WATER BALANCE RESULTS

The water balance model was run for the three climate conditions; climate normal, 1:100 year wet, and 1:100 year dry. As the height of water increases with tailings deposition over time, monthly storage curves were modelled or interpolated to estimate water elevation in the pond based on existing tailings deposition and spigot locations/elevations in the tailings deposition plan. The relationship of pond elevation to water volume was simulated in Muck3D. This relationship informs operation of the effluent treatment plant and management of the pond water levels or decant levels in the tailings pond, as shown in Figure 6.1.

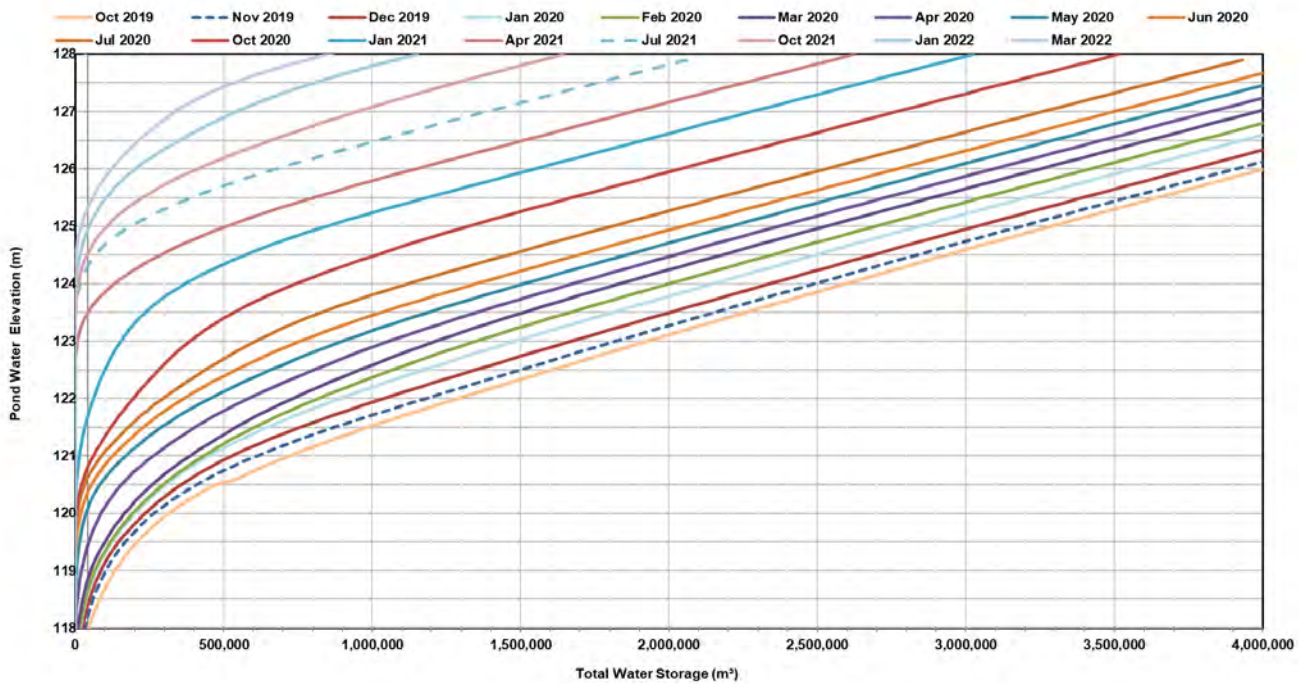


Figure 6.1 Pond Water Elevation Vs. Total Water Storage in TMF

Schematics showing the predicted elevations and volume of tailings and water with respect to time for the simulation period and the simulated operation of the Effluent Treatment Plant (ETP) are presented in Figures 6.2, to 6.4. Forecasted average daily runoff by facility area is presented in Figure 6.5 for the climate normal condition from March 2019 to March 2020.

Each model run was completed assuming that the pond level is maintained at the minimum operating pond levels with the ETP shutdown for the 4 frozen winter months of December through March, with the exception of the last winter of operation. The top of the tailings beach is based on forecasted tailings deposition strategy, as described in Section 5.0. The required IDF freeboard of 0.7 m is shown on the figure in addition to the recommended 0.5 m buffer to account for model uncertainty.



6.1 MINIMUM ELEVATION OF TAILINGS DAM

Minimum storage elevations were forecasted based on the results of the water balance model for the 1:100 year wet climate scenario (Figure 6.3). Based on the simulation, the minimum required clay core elevation is the maximum of the IDF elevation above the pond level and the top of the tailings beach elevation. The minimum clay core elevation is summarized in Table 6.1 for each month of the simulation. The final month of operation is forecasted in March 2022 when the TMF reaches ultimate stage, corresponding with a forecasted water elevation of 127.3 m and assuming 570,000 m³ of water volume.

As noted in the Figure 6.3, under the 1:100 year wet climate scenario, pond levels steadily increase above the top of the tailings beach over the 4 months when the ETP is shut down in combination with 1:100 year wet spring precipitation. This places increased hydraulic loads against the dam, reduces deposited tailings density and makes sloped beach formation more difficult. This also leaves little buffer to manage an extreme runoff event. Should pond levels approach the top of tailings beach than the ETP should be turned on, even in the winter months.

6.2 OPERATION OF EFFLUENT TREATMENT PLANT

Operation of the ETP in December to March is not planned under the climate normal conditions. Shutting down the ETP over the winter avoids operational issues that arise when operation in subzero temperatures however will result in higher pond volumes and lower tailings densities.

As shown in Figure 6.2 to 6.4, should consecutive wet conditions occur, the ETP will have to run throughout the winter in addition to the following summer at the current rate of 300 m³/hr to lower pond volumes to the desired inactive storage volumes. Alternatively, ETP treatment rates could be increased to the maximum design plant capacity of 400 m³/hr or build up the dam to increase the available active storage. In addition, to prepare for reclamation and closure of the TMF using a dry cover, the water volume in the pond should be maintained low the last winter of operation, requiring operation of the ETP.



WATER BALANCE REVISION #13

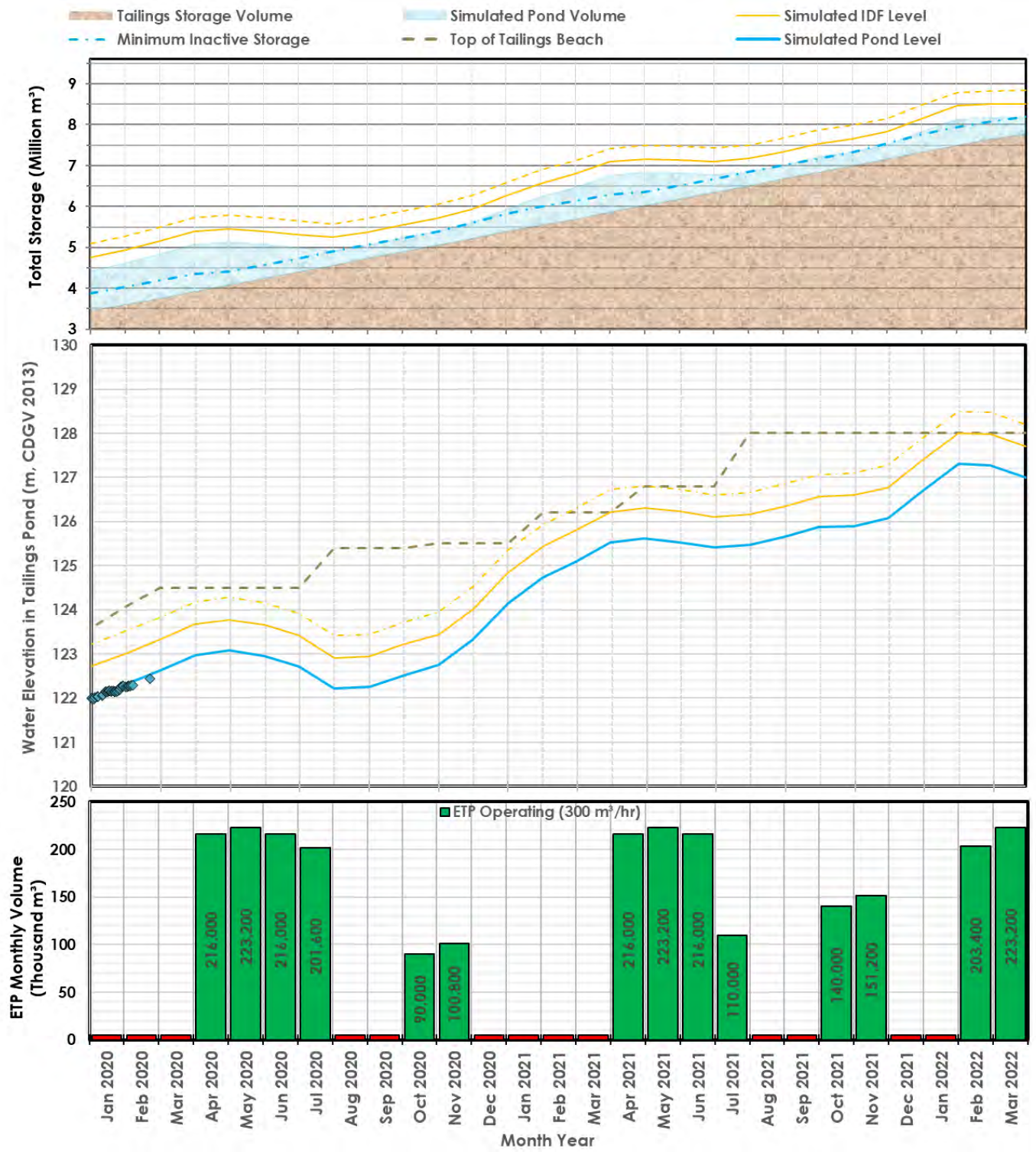


Figure 6.2 Water Balance Run - Climate Normal Condition



WATER BALANCE REVISION #13

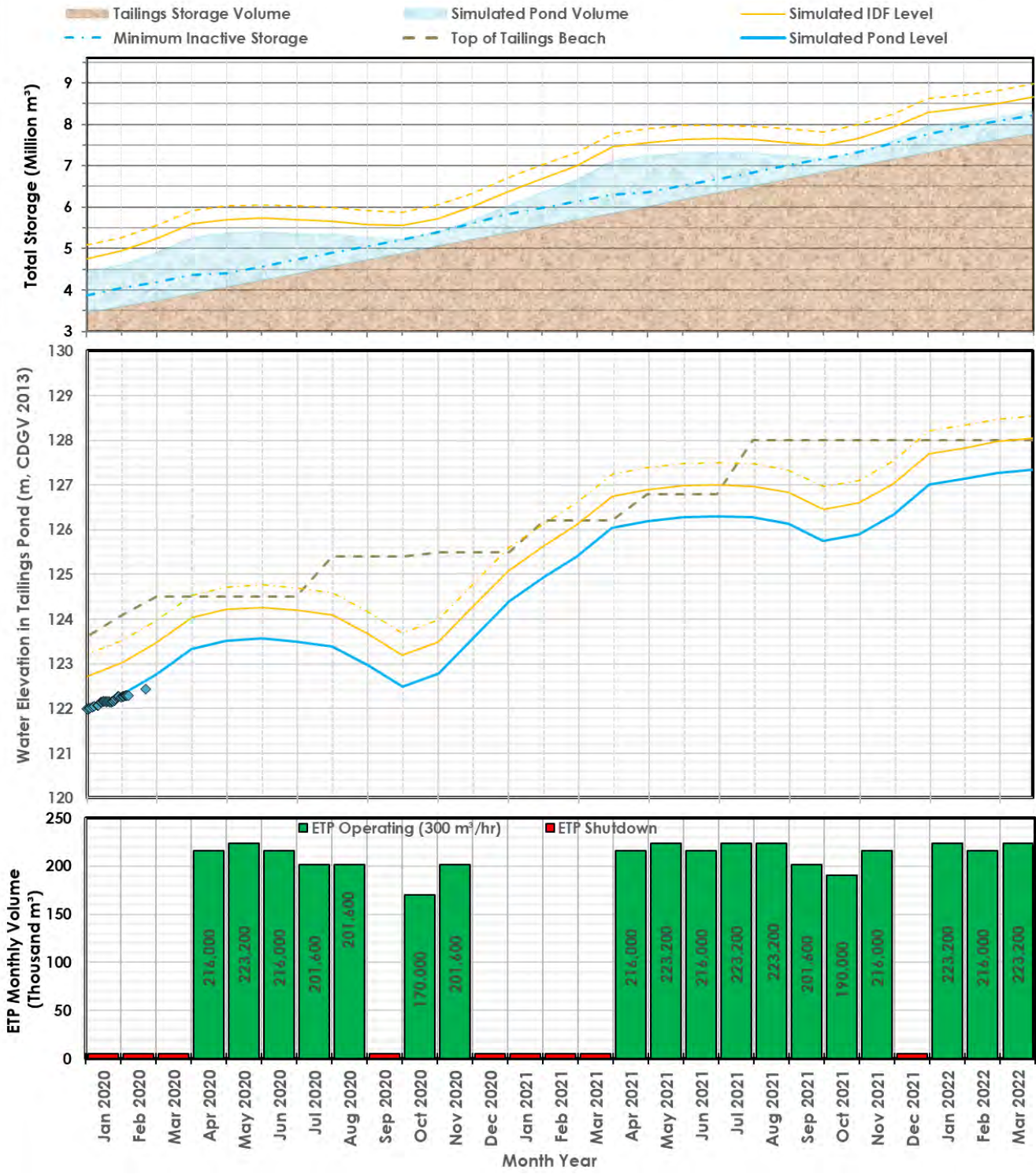


Figure 6.3 Water Balance Run – 1:100 Year Wet Condition



WATER BALANCE REVISION #13

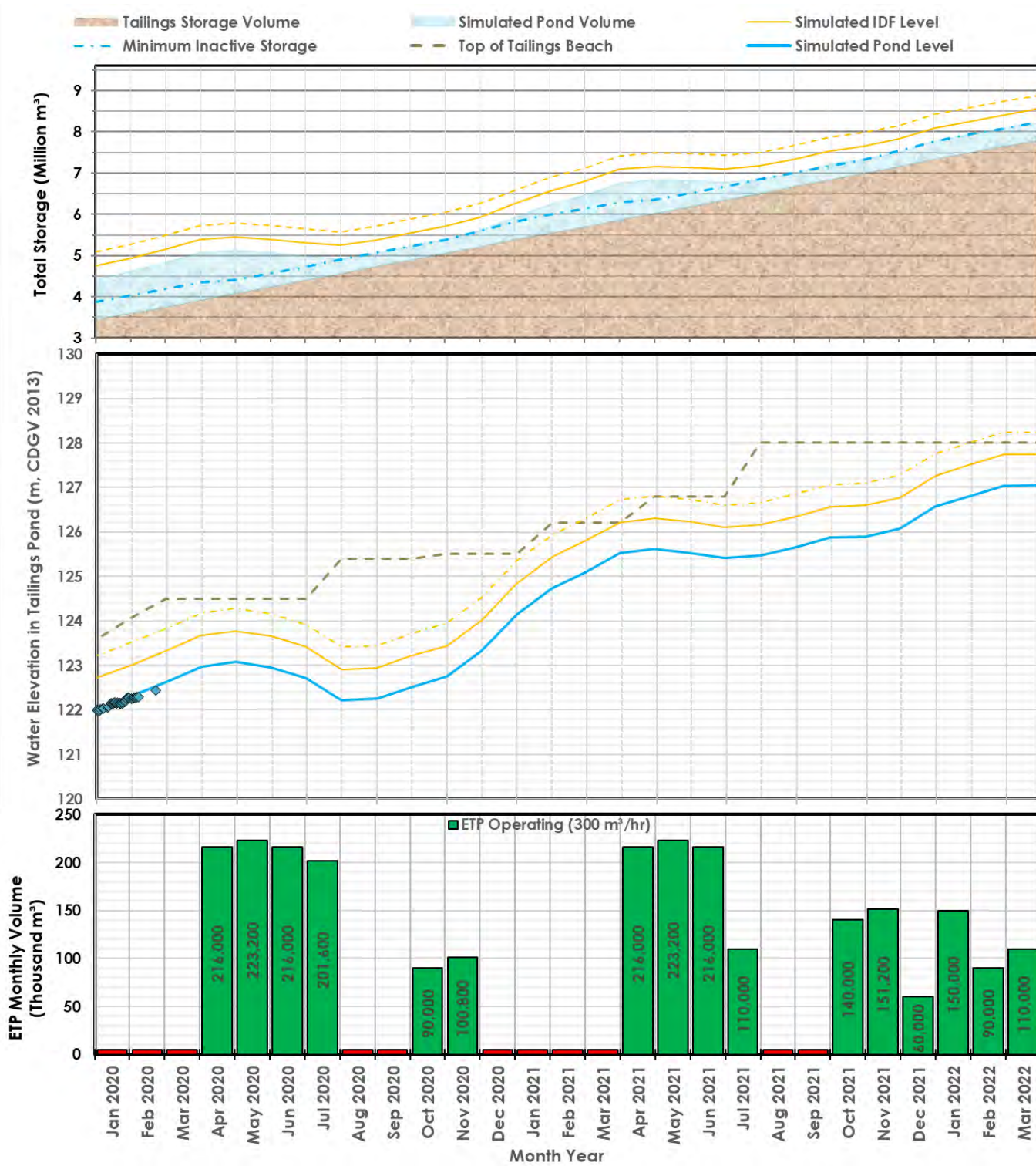
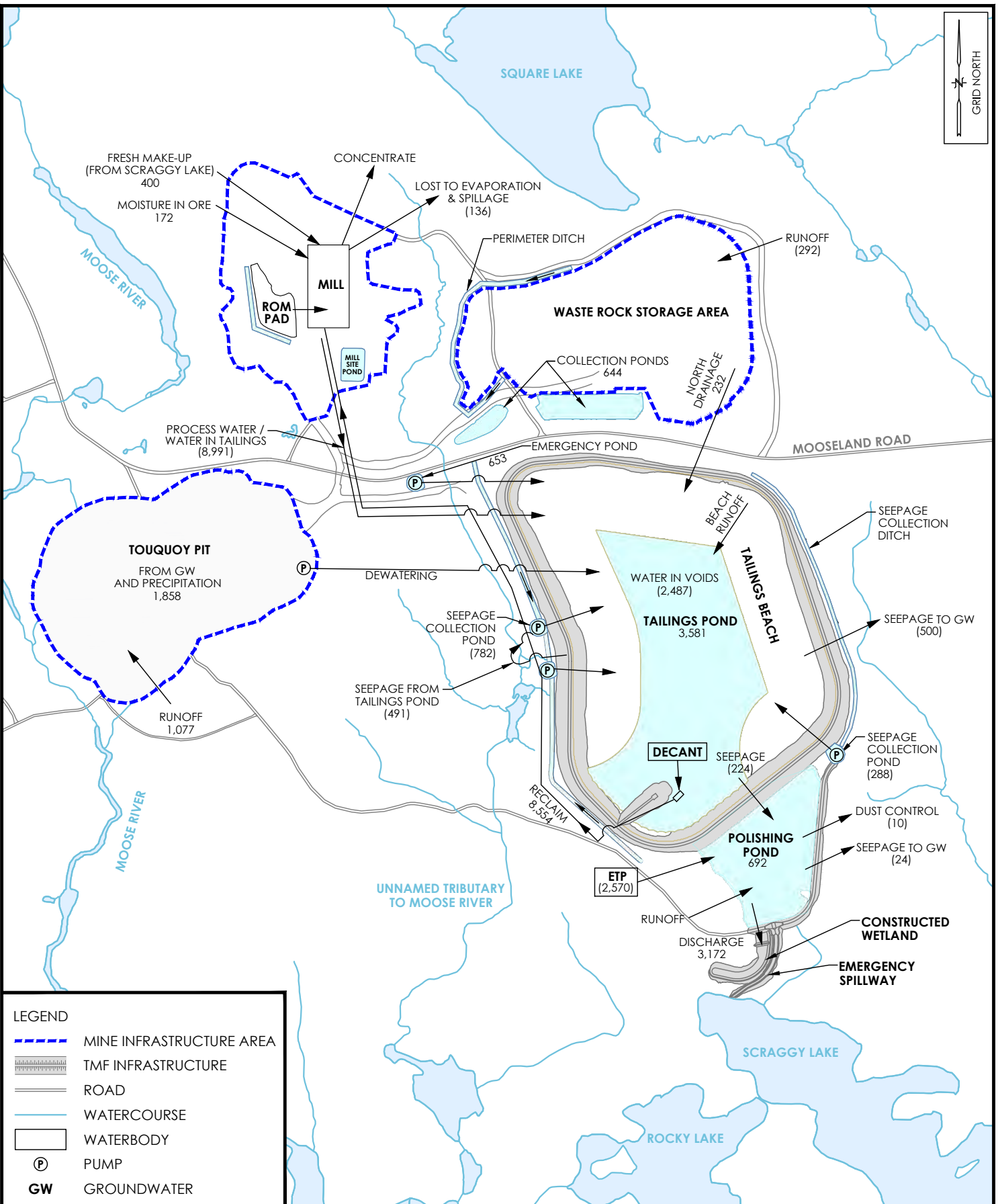
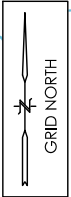


Figure 6.4 Water Balance Run – 1:100 Year Dry Condition





LEGEND	
	MINE INFRASTRUCTURE AREA
	TMF INFRASTRUCTURE
	ROAD
	WATERCOURSE
	WATERBODY
	PUMP
	GROUNDWATER

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MINE PROCESS FLOW DIAGRAM

TOUQUOY GOLD PROJECT
HALIFAX COUNTY, NOVA SCOTIA

Job No.:	121619250
Scale:	N.T.S.
Date:	2020-04-06
Dwn. By:	JL
App'd By:	RJ

Fig. No.: **6.5**

Client: ATLANTIC MINING NS CORP

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WATER BALANCE REVISION #13

Table 6.1 Storage in Tailings Pond under 1:100 Year Wet Climate Condition

Storage Elevation	The End of Month Year											
	Mar 2020	Apr 2020	May 2020	Jun 2020	Jul 2020	Aug 2020	Sep 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021
Pond Water Elev. (m)	123.3	123.5	123.6	123.5	123.4	123.0	122.5	122.8	123.6	124.4	124.9	125.4
IDF Water Elev. (m)	124.0	124.2	124.3	124.2	124.1	123.7	123.2	123.5	124.3	125.1	125.6	126.1
Top of Tailings Beach Elev. (m)	124.5	124.5	124.5	124.5	125.4	125.4	125.4	125.5	125.5	125.5	126.2	126.2
Min. Required Clay Core Elev. (m) *	124.5	124.5	124.5	124.5	125.4	125.4	125.4	125.5	125.5	125.5	126.2	126.2
Water Volume (m ³)	1,350,742	1,302,990	1,164,711	970,018	771,833	526,704	331,976	337,053	460,189	661,536	809,154	968,932
Storage Elevation	The End of Month of Year (2021-2022)											
	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Jan 2022	Feb 2022
Pond Water Elev. (m)	126.0	126.2	126.3	126.3	126.3	126.1	125.8	125.9	126.3	127.0	127.1	127.3
IDF Water Elev. (m)	126.7	126.9	127.0	127.0	127.0	126.8	126.5	126.6	127.0	127.7	127.8	128.0
Top of Tailings Beach Elev. (m)	126.2	126.8	126.8	126.8	128.0	128.0	128.0	128.0	128.0	128.0	128.0	128.0
Min. Required Clay Core Elev. (m) *	126.7	126.9	127.0	127.0	128.0	128.0	128.0	128.0	128.0	128.0	128.0	128.0
Water Volume (m ³)	1,259,516	1,211,390	1,117,338	970,788	791,981	558,600	325,980	324,902	433,639	634,986	559,404	525,776
Min. Operating Water Volume (m ³)	440,000	330,000	330,000	330,000	330,000	330,000	330,000	330,000	385,000	440,000	440,000	440,000

Note: * In some cases, this value may need to be increased by 0.5 m to account for the model uncertainty.



6.3 MINIMUM WATER STORAGE

The minimum inactive storage level is based on the minimum water depth to accommodate pumping in addition to the desired water storage in a water deficit scenario. Minimum storage level or operating water level changes each month as the shape of the pond changes monthly with tailings deposition. When water levels reach the minimum storage levels the ETP is shutdown, as water levels should not drop below the desired inactive storage level. The base of the pond beneath the decant barge should be routinely confirmed with monthly manual water depth measurements.

The minimum storage criteria in the frozen months of 440,000 m³, and in the non-frozen months of 330,000 m³, as described in the sections below and included in the previous Table 6.1 by month. In accordance with the tailings deposition plan, management of pond water levels near the minimum storage level (i.e., 440,000 m³ in the frozen months and 330,000 m³ in the non-frozen months) should assist in maintaining a tailings beach.

Process Water Supply Criteria:

The inactive storage volume in the TMF is based on the potential number of days without rainfall. A review of the observed days without rainfall at the Halifax climate station is presented in Figure 6.6. A total of 28 consecutive days without rainfall was observed in August 1974 and a total of 43 consecutive days without rainfall in January/February 1978. Therefore, it is recommended that 1 month of process water supply of 121,000 m³ in the non-frozen months is maintained in the TMF, this volume is associated to the maximum water deficit in the summer, accounting for evaporation losses. In the winter months, approximately 1.4 months process water supply is maintained associated to the maximum winter deficit of 90,000 m³. Based on the 1:100 year dry climate conditions, an additional 50,000 m³ is required to maintain the operation of the decant barge criteria.

The minimum storage criteria is 270,000 m³ in the non-frozen months and 245,000 m³ in the frozen months when considering the water available for reclaim from the tailings slurry input.

Operation of Decant Barge: The process water volume is accessible for decant via the active decant barge by meeting the minimum water depth criteria for operation of the decant barge. A water depth of 3 m was assumed to be required for operation of the decant barge, as provided by AMNS. A bubbler system will be installed around the decant barge to facilitate pumping under frozen conditions.

Operation of decant barge criteria was increased from 2 m to 3 m in the minimum storage criteria corresponding to a maximum volume over the simulation period of 160,000 m³.



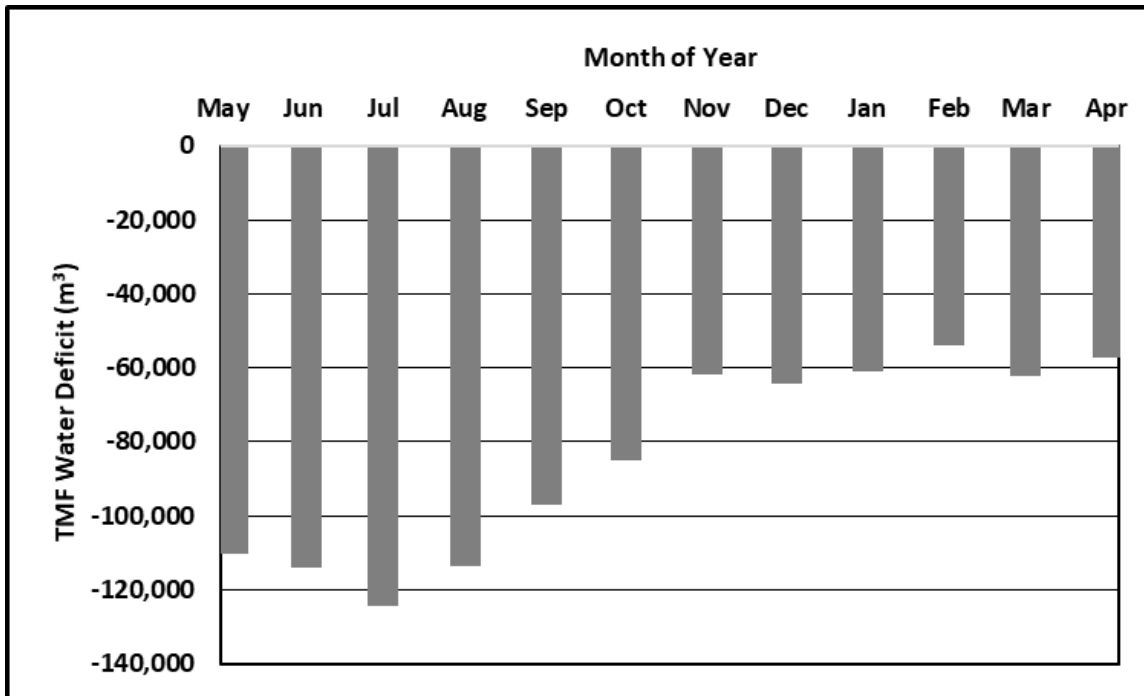


Figure 6.6 Monthly TMF Water Deficit Assuming No Precipitation (mm)

Ice Sequestration: As the remainder of the pond has a solid ice cover in January and February, 0.50 m for ice-water sequestration water /ice depth or 0.45 m water depth was assumed to be unavailable for decant in these months results of the Stephan equation of 0.50 m, calibrated to observed ice thickness in past years of 0.30 m. In winter months, this depth is in addition to the 3 m required for pumping, for a total of 3.5 m.

The minimum ice depth criteria of 140,000 m³ volume over the simulation period.

Simulated Minimum Water Depth

Minimum water storage was forecasted based on the results of the water balance model for the 100-year dry climate scenario. As identified in the previous section, the model simulated low water depths around the existing barge location (at the end of the decant structure). As the tailings slopes are flatter than expected, the tailings are extending further horizontally which is resulting in a shallower and wider pond. Refer to Figure 5.5, the model simulation for the month of July 31, 2021. In this month, the forecasted water depth at the barge is 1 m which is not an adequate depth to operate the decant barge. The barge will have to be relocated to the center of the pond, increase the operational minimum water storage and/or conduct routine dredging. Model Sensitivity and Uncertainty

6.4 SENSITIVITY – MONTHLY DISTRIBUTION OF 1:100 YEAR WET

As described in section 3.1, monthly distribution of the 1:100 year wet was based on the wettest year in the applicable historic record (1972). The wettest 15 years of the historical climate record were reviewed to identify the “worst-case” scenario in terms of maximum water levels in the TSF and the forecasted minimum elevation of



WATER BALANCE REVISION #13

the clay core. The highest pond level would be associated with the highest precipitation occurring over the 4 months when the ETP is shutdown and until the ETP can drawdown the pond level in the spring (December – April, inclusive).

The three wettest years on record at Environment Canada’s Halifax International Airport climate (station ID 8202251) were 1972, 1979, and 1971, with annual total precipitation of 1931 mm, 1874 mm, and 1778 mm and monthly distribution of runoff between December – March of 46%, 46%, and 39% of annual precipitation, respectively. The years 1972 and 1979 have a similar distribution and therefore 1979 was not considered further. The eleventh wettest year was 2014 with a rainfall of 1579 mm, which has the highest monthly distribution of total precipitation of 60% that occurs between December – April. The monthly distribution for these years are shown in Figure 7.1 along with the mean annual distribution for the historic record.

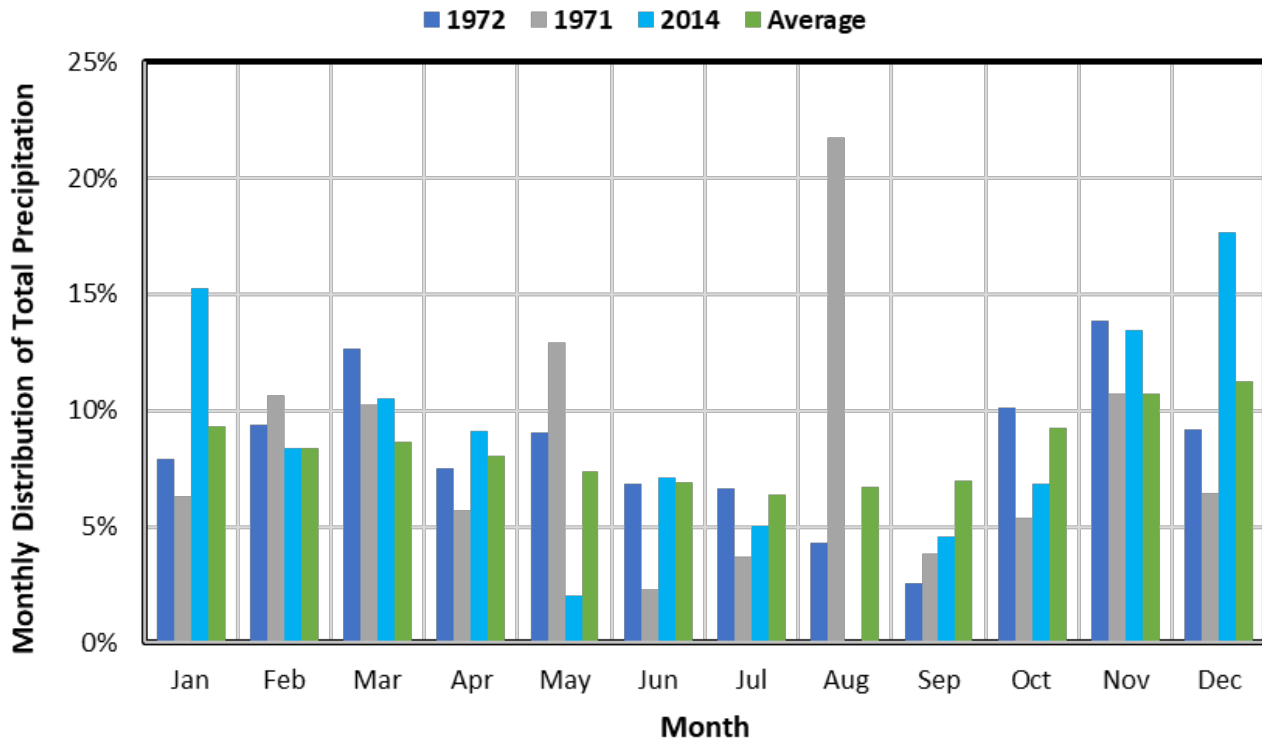


Figure 7.7 Monthly Distribution of Total Precipitation of Halifax Station – Wet

The 2014 distribution results in the “worst-case” scenario in terms of water levels in the TSF, as 60% of total precipitation occurs between December – April, which are the months when the ETP is shut down and the pond level has just begun to lower. The end of April corresponds to the highest potential pond level in the TMF. The TMF pond level was simulated using this distribution and found that the highest pond level in April 2021 was approximately 300,000 m³ higher than the 1972 precipitation distribution. Results of this water balance run are included in Figure 7.2.



WATER BALANCE REVISION #13

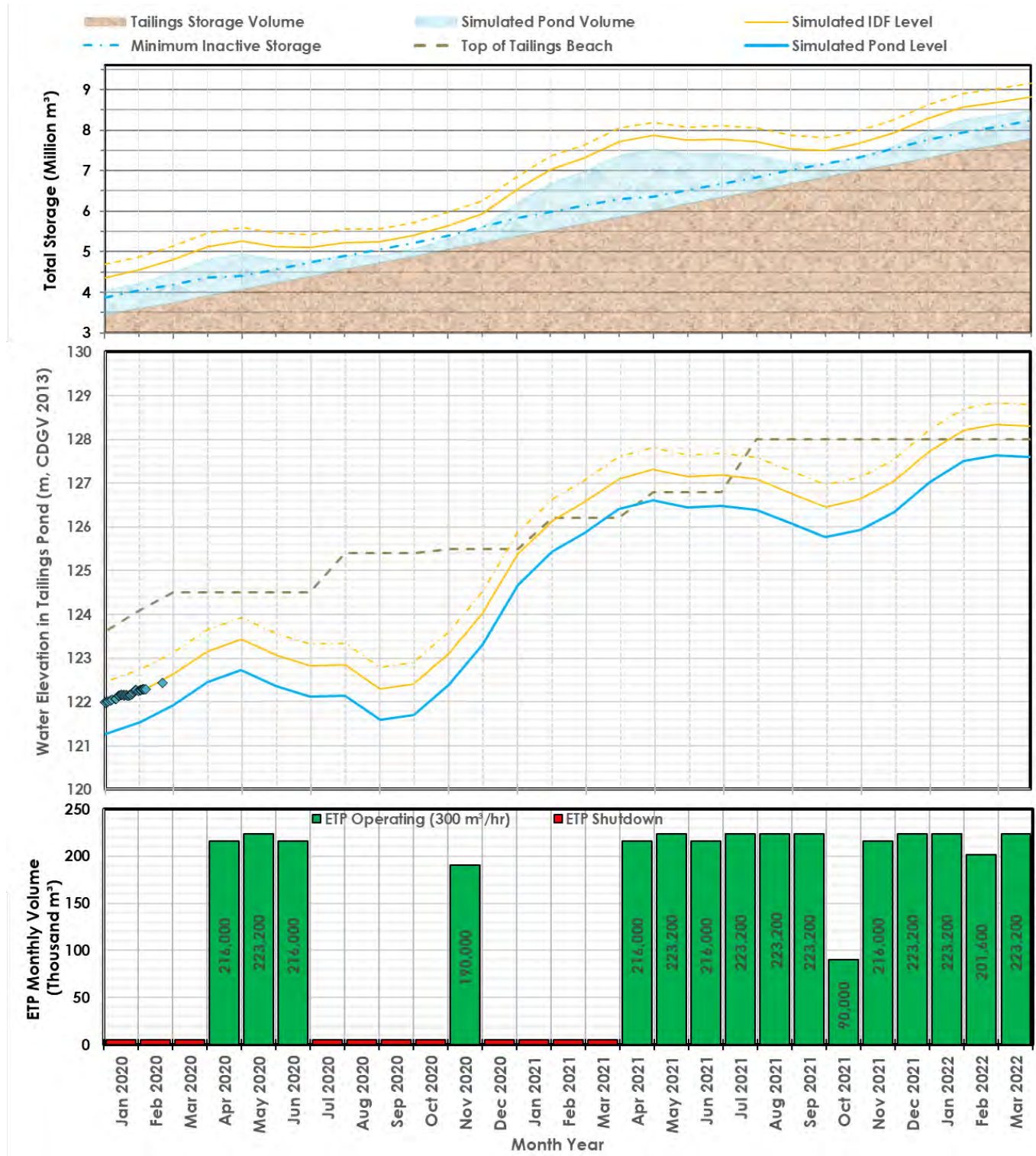


Figure 7.8 Water Balance Run – 1:100 Year Wet Condition – 2014 Precipitation Distribution



6.5 SENSITIVITY – MONTHLY DISTRIBUTION OF 1:100 YEAR DRY

As described in section 3.1, monthly distribution of the 1:100 year dry was based on the driest year in the applicable historic record (1965). The historical climate record was reviewed to identify the “worst-case” scenario in terms of minimum water levels in the TSF and the forecasted minimum water storage volume. The lowest pond level would be associated with the two driest consecutive months that occurs once pond levels reached minimum inactive storage levels in the TSF, typically in August/September.

The two driest years on record at Environment Canada’s Halifax International Airport climate (station ID 8202251) are 1965, 2001, with annual total precipitation of 1040 mm and 1070 mm, with respectively. The year 2014 had the lowest combined precipitation in August and September of 4.7% of total annual precipitation. The monthly distribution for these years are shown in Figure 7.3 along with the mean annual distribution for the historic record.

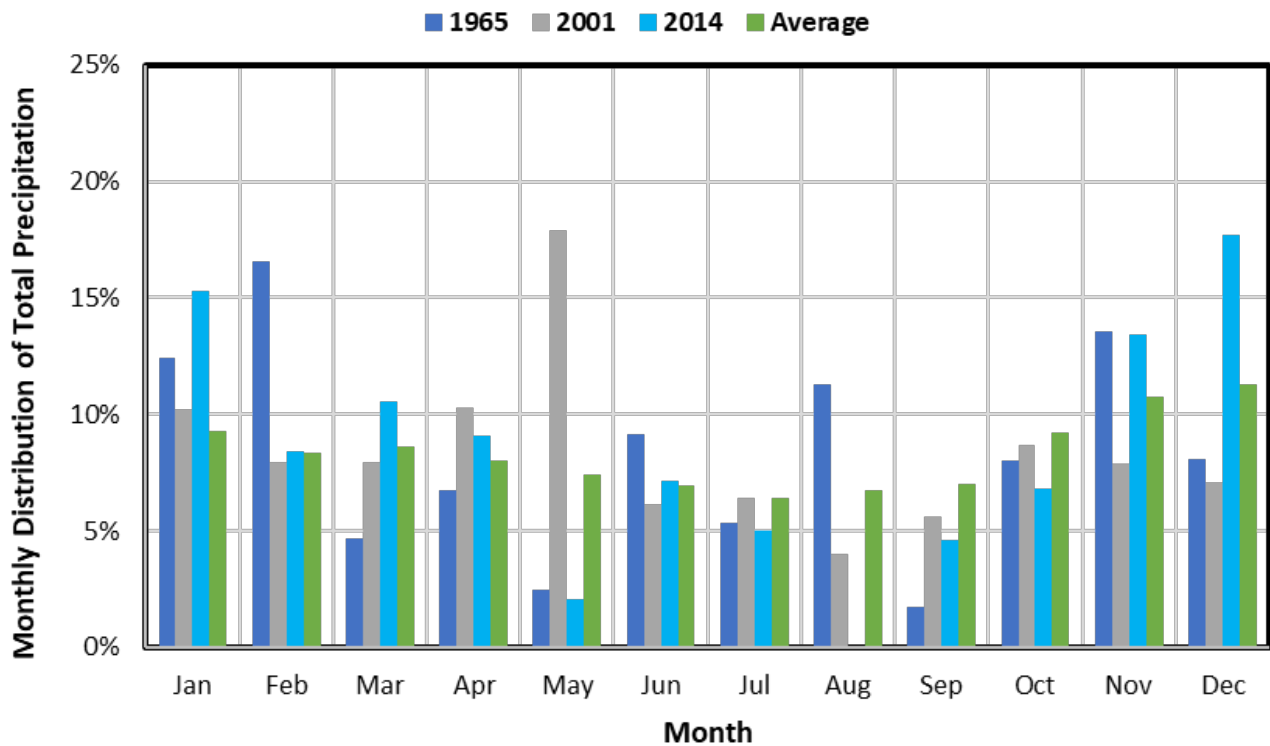


Figure 7.9 Monthly Distribution of Total Precipitation of Halifax Station – Dry

The 2014 distribution results in the “worst-case” scenario in terms of water levels in the TSF, as there is little rainfall when the pond is already at the minimum inactive storage levels. The TMF pond level was simulated using this distribution and found low TMF water volumes of approximately 230,000 -260,000 m³ for the months of September – February 2020/2021. This would result in low water depths of less than 3 m at the decant. Results of this water balance run are included in Figure 7.4.



WATER BALANCE REVISION #13

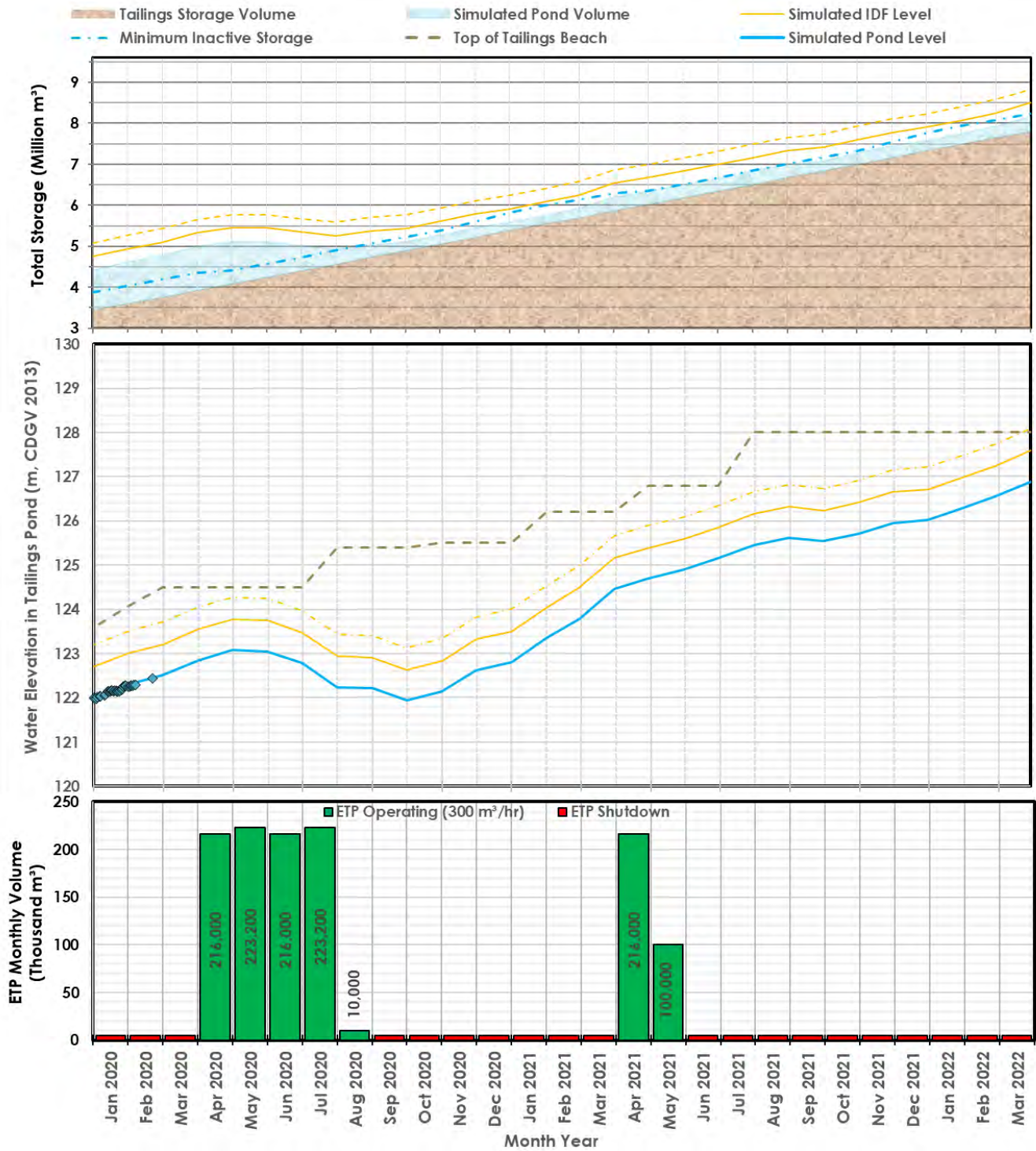


Figure 7.10 Water Balance Run – 1:100 Year Dry Condition – 2014 Precipitation Distribution



6.6 SENSITIVITY – TIMING OF SPRING FRESHET

Total precipitation at the Halifax climate station is recorded as rainfall and snowfall. As shown in Figure 7.5, the year with the highest distribution of total precipitation as snowfall was 1963 of 27.5%. The year with the lowest amount of total precipitation as snowfall was 2001 of 5.6%. The water balance model assumes that some of this precipitation in the frozen months is stored as snow and melted in the spring as runoff. The water balance assumes that most of this melt occurs in the month of April. Based on a review of climate normal records for the Halifax station the majority of spring melt occurs in the month of April.

The ETP is scheduled to be shutdown during the 4 months of the winter, storing the total precipitation as rain and snow on the TMF. The proportion of snow storage versus snow melt in the four frozen months of December - March will be balanced by end of April when the model predicts that the remainder of snowmelt will be captured. Should the spring melt be delayed until May than pond levels will be lower than if melt occurred in April as a result of the planned operation of the ETP over the entire month of April.

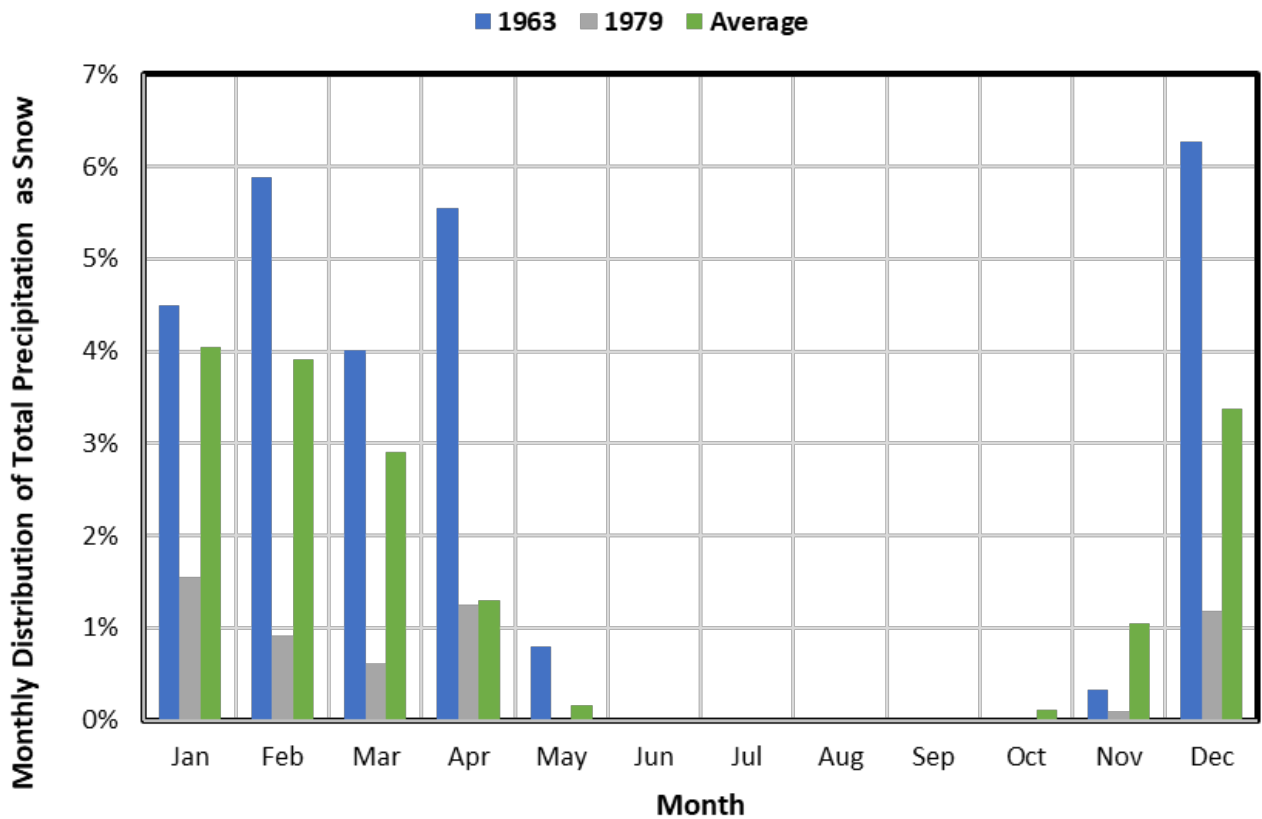


Figure 7.11 Monthly Distribution of Total Precipitation as Snow



6.7 SENSITIVITY – DELAY OF ETP OPERATION

As the highest pond level in the TMF was forecasted at the end of April, delay of the ETP start-up by 1-month from April 1 to May 1st results in the largest impact of pond levels. The increase in pond volume would be equivalent to 1 month of ETP capacity of 223,200 m³ or 35 cm, based on the stage-storage curve for the month of April 2021. This delay may also result in inundating tailings beaches and extend the operation of the ETP in the summer months.

6.8 SENSITIVITY – TAILINGS DEPOSITION SLOPES

Additional tailings deposition modeling was conducted to understand the sensitivity of tailings deposition slopes on the ultimate tailing's capacity. The tailings deposition model was run in Muck3D based on the design tailings beach slopes of 1% and sub-aqueous tailings slopes of 3%. In addition, the same inflection point was used as observed in the 2019 survey, meaning that the 1% slope extended below the water line before changing to the 3% slope. In addition, the model assumed that the water volume fluctuated overtime resulting in a final pond storage volume of 440,000 m³.

The model resulted in approximately 700,000 m³ less tailings capacity than that based on the 2019 surveyed tailings deposition slopes. This volume represents more than 4 months of tailings deposited in the TMF. Additional tailings capacity should be considered in planning to account for the uncertainty in tailings deposition slopes and to avoid any unplanned shortage of capacity in the TMF.

6.9 MODEL UNCERTAINTY

Uncertainty in a water balance commonly arises in the variability in climate and the conditions that effect the runoff, such as, the degree of saturation and characteristics of the soil, and vegetation cover. Uncertainty also exists in parameters such as recharge (seepage), evaporation and measured parameters as metering equipment is limited based on the accuracy of the unit. In addition, as the mine operation is dynamic, unplanned changes in operation such as production rates, tailings deposition strategies due to pump limitations or shutdowns will arise. Uncertainty of 0.5 m to account for these model parameters has been presented in the storage tables in the Section 6, to support planning.

As noted in Table 4.1, the difference from forecasted water volumes to measured water volumes in the TMF for each of the metered model input parameters characterizes this model sensitivity and uncertainty. As noted in Table 4.1, the measured pumped volume from the waste rock ponds to the TMF between April 2019 and January 2020 was approximately 372,000 m³ less than the modelled forecasts. This value is the greatest difference between measured versus simulated identified in the water balance for the same period, representing roughly 0.8 m of TMF pond depth based on the stage storage curve of January 2020. In most cases, the water balance model simulated additional water input than the metered pumping records. This is conservative when considering the minimum clay core elevation but indicates a vulnerability to the process water supply when considering the minimum water elevation required to operate the barge.



7.0 RECOMMENDATIONS

It is recommended that a dam raise be constructed to meet the required schedule in accordance with the highest modelled precipitation scenario - the 1:100 year wet climate scenario, as summarized in Table 6.1.

In reference to dam construction scheduling the results of Revision #13 show that the existing clay core elevation of 125 m is adequate until July 2020. In July 2020 the top of the tailings beach is forecasted to be at an elevation of 125.5 m.

As presented in Table 6.1 a minimum of 0.5 m of additional clay core buffer height above the IDF is recommended to account for model sensitivity and uncertainty to include potential future changes in mill operation, tailings deposition, or model assumptions and/or model uncertainties. This buffer height is included in Figures 6.2, 6.3 & 6.4 as the IDF level (Model Sensitivity & Uncertainty) that should be carried forward in sequencing of construction of the dam raise.

A review of active and inactive storage volumes in the TMF should be considered to facilitate operation of the TMF and effluent treatment plant, as management of water levels may be more easily optimized in the model than of operation of the decant structure and effluent treatment plant. Water depth around the decant barge should be manually confirmed monthly to initiate any required action to increase water depth to the required 3 m. Opportunities to decrease the necessary water depth to operate the barge should be considered.

As measured parameters become available in construction and operation, the existing water balance model will routinely be updated to reflect these changes. To help improve the water balance model as a predictive tool we recommend the following:

- Install flow gauges on remaining pump inputs into the TMF (e.g. Emergency Dump Pond, North Drainage from Waste Rock Pile).
- Routinely check/calibrate the on-site climate station to ensure quality assurance and control.
- Conduct annual bathymetric/topographic surveys, with all measurements conducted within a short time-frame to reduce errors when generating surfaces.
- Continue to update water balance inputs on a weekly scale and adjust water balance input assumptions in the forecast, as needed or at minimum semi-annually.
- Assess magnitude of change when varying from tailings deposition plan to determine if tailings stage storage curves should be updated prior to next water balance.
- To facilitate operation of the effluent treatment plant, a SCADA based water management operations model should be considered that runs through a dashboard allowing for weekly adjustments. Metered data could be tied into a water balance software platform such as Goldsim that Stantec can set-up and share with AMNS.



8.0 CLOSURE

We trust the information provided within this document meets your current requirements. If you require additional information, please do not hesitate to contact us.

Stantec Consulting Ltd.



Rachel Jones, P.Eng.
Water Resources Engineer



Paul Deering, P.Eng., P.Geo.
TMF Engineer of Record



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Appendix C.5

Independent Tailings Review Board 2020 Summary Letter

Touquoy Mine Independent Tailings Review Board

Karlis Jansons, P.Eng.
Peter Lighthall, P.Eng.
Alan Martin, P.Geo., R.P.Bio.

April 15, 2021

Atlantic Gold, a St Barbara Ltd. Company
Moose River Gold Mine: 6749 Moose River Road, RR#2
Middle Musquodoboit, NS B0N 1X0

Attention: Laird Brownlie (General Manager)
James Millard (Manager, Environment)
Melissa Nicholson (Environmental Superintendent)

This letter summarizes the 2020 activities and key findings of the Touquoy Mine Independent Tailings Review Board (ITRB).

An ITRB review meeting (the sixth official meeting of the ITRB) was held on October 28-29, 2020. Due to travel restrictions of the pandemic, the meeting was held on-line (MS Teams). No site visit was made in 2020. In preparation for the meeting, the ITRB was provided with a comprehensive package of relevant reports and studies, as well as drone videos and photographs showing the tailings storage facility.

Attendees for the on-line meeting included:

- Laird Brownlie – General Manager
- James (Jim) Millard – Manager Environment & Community
- Melissa Nicholson – Superintendent Environment
- Laura Struthers – Environment Specialist
- Andrew Taylor – Mill Manager
- Ryan Keating – TMF EIT
- Rebecca Payant – Senior Metallurgist
- Scot Klingmann – Mine Manager
- Robert Halas – Technical Services Superintendent
- Drew Pelley – Superintendent Mine Geology
- Danielle Finlayson-Bourque – Environmental Permitting Supervisor
- Veronica Chisolm - Environmental Permitting Project Manager
- Brett Mackenzie – Environmental Specialist
- Jenifer Adshade – Environmental Analyst
- Paul Deering (Stantec) – Engineer of Record (EOR)
- Jeff Gilchrist (Stantec) – Geotechnical Engineer
- Jonathan Keizer (Stantec)– Hydrogeologist
- Dirk Van Zyl (external consultant)

Presentations were made to the ITRB covering TMF construction/operation, water management, water treatment, environmental monitoring, and the status of 2019 ITRB recommendations.

The ITRB summarized its key findings as follows:

- Atlantic presents a complete and capable team with a robust approach to tailings, waste rock and water management. An excellent working relationship with the EOR is noted.
- Atlantic presented the status of all recommendations put forth by the ITRB in 2019. All items have either been addressed or are in progress of being further evaluated.
- Dam construction continues to be well planned and executed.
- Atlantic has a robust governance structure in place, including a revised OMS manual, RACI framework, and effective communication framework.
- The 2019 surface water and groundwater monitoring program is meeting the requirements of the Industrial Approval (IA). The surface water and groundwater monitoring programs, and the associated trigger (tiers) and action framework, continue to provide an effective means to track changes and implement actions as required.

The ITRB concluded from its 2020 review that the overall stewardship of the TMF met its expectations of good practice.

The ITRB did not identify any conditions that compromise TSF integrity or non-compliance with regards to TSF operation, water/waste management or water quality. The ITRB observed some conditions and practices that could be improved. These are noted in our November 24, 2020 report which is a detailed accounting of our findings and recommendations.

Yours truly,


Touquoy Project Independent Tailings Review Board



Karlis J. Jansons, P.Eng.
Principal, GeoMin Initiatives Inc.



Peter C. Lighthall, P. Eng.
Consulting Geotechnical Engineer



Alan Martin, M.Sc., P.Geo., R.P.Bio.
Principal, Senior Geochemist and Biologist
Lorax Environmental Services Ltd.

Appendix C.6

Review of Operational ML/ARD Monitoring Data

2020 Review of the Touquoy Operational ML/ARD Monitoring
Procedure Letter

Tailings Solids Sampling Standard Operating Procedure

Blast Material Sampling and Handling Standard Operating
Procedure

Touquoy Verification Monitoring Work Plan



TECHNICAL MEMORANDUM

To: Melissa Nicholson, Laura Struthers (AMNS)

Date: April 12, 2021

From: Timo Kirchner (Lorax)

Project #: A563-3

Subject: Touquoy Gold Mine - Review of 2020 Operational ML/ARD Monitoring Data

1. Introduction

The Touquoy Gold Mine, owned by Atlantic Mining Nova Scotia (AMNS), is located in the Moose River Gold Mines District, around 60 km northeast of Halifax, Nova Scotia and has commenced operations in September 2017. The amended Industrial Approval (IA) No. 2012-084244-08 issued by Nova Scotia Environment (NSE, 2018) outlines requirements regarding management and monitoring of the metal leaching and acid rock drainage (ML/ARD) in mine rock and tailings exposed during Touquoy operations and stipulates that “[...] *the Approval Holder shall collect and analyze samples of fresh waste rock and tailings for at least every 100,000 tonnes of ore generated.*”

The methods and sampling frequency employed during the collection and analysis of mine rock material for ML/ARD monitoring at the Touquoy site are described in detail in the respective standard operating procedures (SOPs) (AMNS, 2019, 2020).

To satisfy requirements outlined in the amended IA, Lorax Environmental Services Ltd. (Lorax) was retained by AMNS as a Qualified Geochemist to periodically review, assess, and report on ML/ARD monitoring SOPs and analytical results. This memorandum provides a discussion of all operational ML/ARD monitoring data collected in 2020 in support of AMNS’s annual reporting requirements. The data is also evaluated in the context of previous sampling years.

Analytical method procedures are identical to those presented in previous ML/ARD monitoring review documents (e.g., Lorax, 2020) and comprise acid-base accounting (ABA), determination of aqua regia digestible metals, net acid generation (NAG) testing, and shake flask extraction (SFE) testing. The latter two analyses are only conducted on a subset of samples with a net potential ratio (NPR) of <3 and those materials considered for construction of site infrastructure, respectively. The NPR is calculated as the ratio of the modified neutralization potential (NP) and acid potential (AP) based on the sulphide S content of a sample. A discussion of the 2020 monitoring results is provided in the following section. A complete list of the data generated during that year is presented in Appendix A.

2. Results

2.1 Acid-Base Accounting and Solid-phase Metals

2.1.1 Mine Rock

In 2020, a total of 4.1 Mt of ore were mined from the Touquoy pit. During this time period, 189 mine rock samples were submitted for ML/ARD monitoring purposes, which is in compliance with the IA stipulations requiring the collection of at least one monitoring sample per 100,000t of ore mined. Due to the fine interbedding of the geological units, lithological classifications (i.e., greywacke versus argillite) were not attempted. It is understood that a number of the samples submitted for geochemical testing represent low- and medium-grade ore that is temporarily stored within the bounds of the waste rock storage area (WRSA). This material may be removed and processed at a later date.

Within the 2020 mine rock population, 31 samples showed an NPR <2 and can be considered PAG. This constitutes 16% of the overall 2020 mine rock database which is a lower percentage than observed for previous years (Table 1). A total of 65 samples (34%) had an NPR <3 prompting confirmatory NAG testing.

Figure 1 shows the relationships between sulphide S and NPR as well as modified NP and NPR and illustrates that, consistent with observations from previous years, sulphide S has a stronger influence on NPR. While the range of sulphide S values (0.02-1.3%) is similar to that observed in previous years, the median sulphide S value has decreased slightly (Table 1). Modified NP ranges and median values have remained remarkably similar over the >3 years of ML/ARD monitoring.

A preliminary proxy for the rapid determination of PAG rock was proposed based on the finding that a total S content of 0.4% provides a conservative and reliable threshold between PAG and non-PAG (NPAG) mine rock. Due to the analytical capabilities on site, this total sulphur threshold can be used rapidly to pre-screen PAG rock before the full analytical results from an external laboratory are provided. Across the different datasets available to date (pre-2019 to 2020), only two samples (0.04%) show a total S content of less than 0.4% as well as an NPR <2. Only 8% of all samples have an NPR > 2 and a total content of > 0.4%. As such, the previously defined total S threshold remains a reliable and conservative metric to screen PAG mine rock material on site.

Samples with an NPR <3 (n=65) were submitted for confirmatory NAG testing as stipulated in the IA (NSE, 2018). The test oxidizes the sulphide mineral inventory where a post-reaction NAG pH of 4.5 marks the threshold to discern between PAG (pH <4.5) and NPAG (pH ≥ 4.5) samples (Amira, 2002). Figure 2 plots NPR versus NAG pH for the 2020 ML/ARD monitoring database and shows that four (4) samples fall below the NAG pH threshold of 4.5. All of these samples showed an NPR of 0.8 or less consistent with previous results from previous years (Lorax, 2020).

It should be noted that recent research has demonstrated that the single-addition NAG may not always reliably predict the ARD potential due to incomplete dissolution of sulphide minerals under the employed test conditions. The multi-addition NAG test is considered a more conservative metric to supplement routine ABA techniques (Parbhakar-Fox et al., 2018). To evaluate the single-*versus* multi-addition NAG test procedure, a subset of four samples with an NPR <2 from the 2020 ML/ARD database were submitted for both methods. The results show that, although NAG pH values are usually lower in the multi-addition method, none of the four tested samples were conclusively determined to be PAG (Figure 2). This confirms that, despite variable NAG pH values, the two methods yield geochemically consistent results in terms of PAG designation.

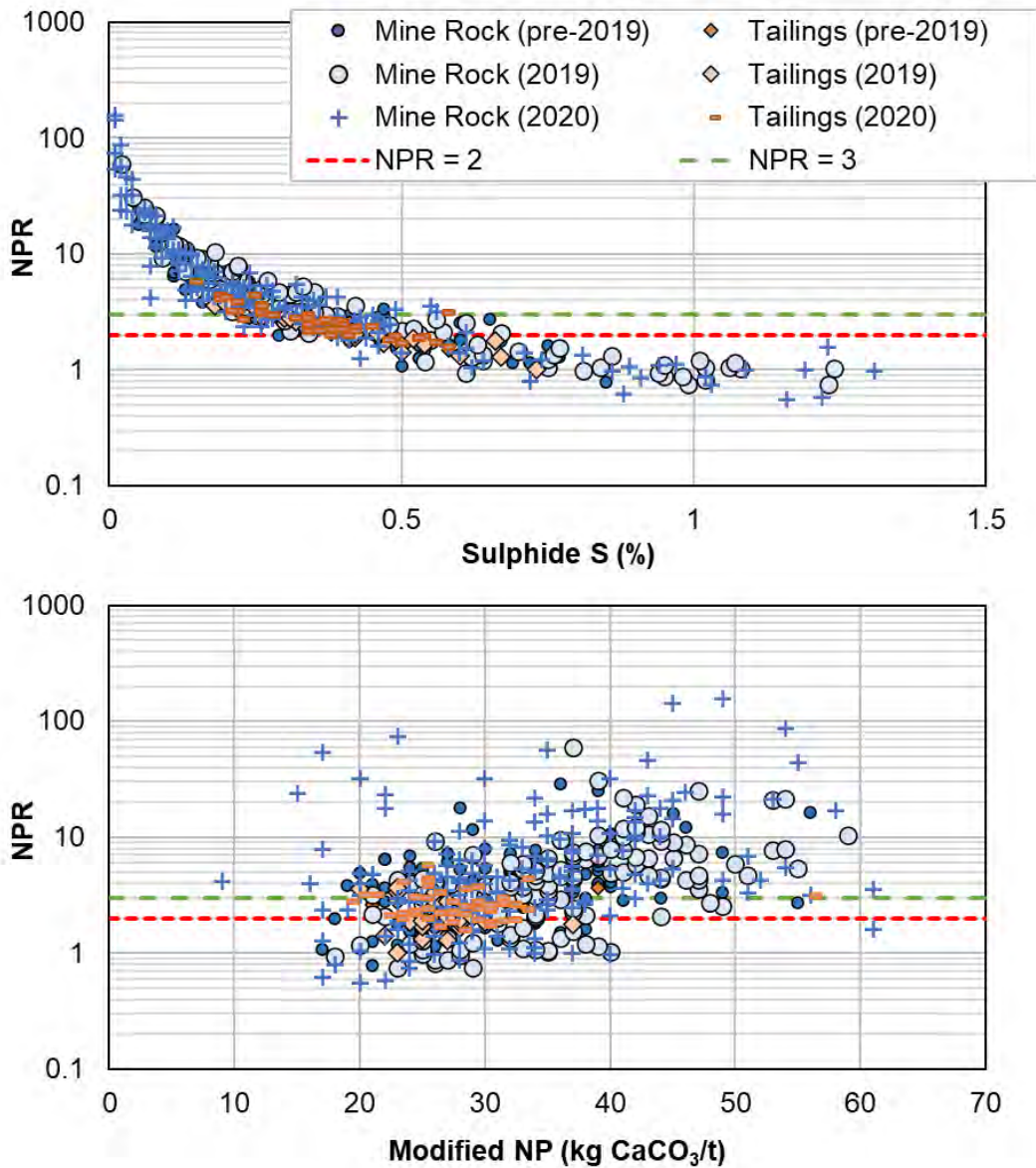


Figure 1: NPR versus sulphide sulphur (top) and modified NP (bottom) in ML/ARD monitoring samples from the Touquoy Mine over the mine years.

Table 1:
Statistical Overview of Acid-Base Accounting Results for Touquoy ML/ARD Monitoring Samples

	Total S	Sulphate S	Sulphide S	AP	TIC	NP	NPR	PAG %
	%	%	%	kg CaCO ₃ /t	%	kg CaCO ₃ /t		
Mine Rock								
<i>Pre-2019 (n = 121)</i>								
Min	0.040	0.010	0.040	1.3	0.15	17	0.79	17%
Median	0.28	0.010	0.25	7.8	0.36	32	3.9	
Max	0.88	0.070	0.85	27	0.65	56	29	
<i>2019 (n = 141)</i>								
Min	0.020	0.010	0.020	0.63	0.15	18	0.74	21%
Median	0.28	0.010	0.27	8.4	0.42	35	3.9	
Max	1.3	0.040	1.2	39	0.79	59	59	
<i>2020 (n = 189)</i>								
Min	0.010	0.010	0.010	0.31	0.050	9.0	0.55	16%
Median	0.23	0.010	0.23	7.2	0.38	31	4.3	
Max	1.3	0.040	1.3	41	0.76	61	157	
Tailings								
<i>Pre-2019 (n = 24)</i>								
Min	0.25	0.010	0.24	7.5	0.23	21	1.5	8%
Median	0.35	0.020	0.34	11	0.31	27	2.7	
Max	0.60	0.030	0.58	18	0.39	39	3.7	
<i>2019 (n = 24)</i>								
Min	0.21	0.010	0.18	5.6	0.22	20	1.0	50%
Median	0.44	0.025	0.42	13	0.30	26	2.0	
Max	0.74	0.030	0.73	23	0.51	37	3.7	
<i>2020 (n = 55)</i>								
Min	0.14	0.010	0.14	4.4	0.22	19	1.6	20%
Median	0.38	0.010	0.37	12	0.32	27	2.4	
Max	0.58	0.030	0.57	18	0.46	56	5.7	

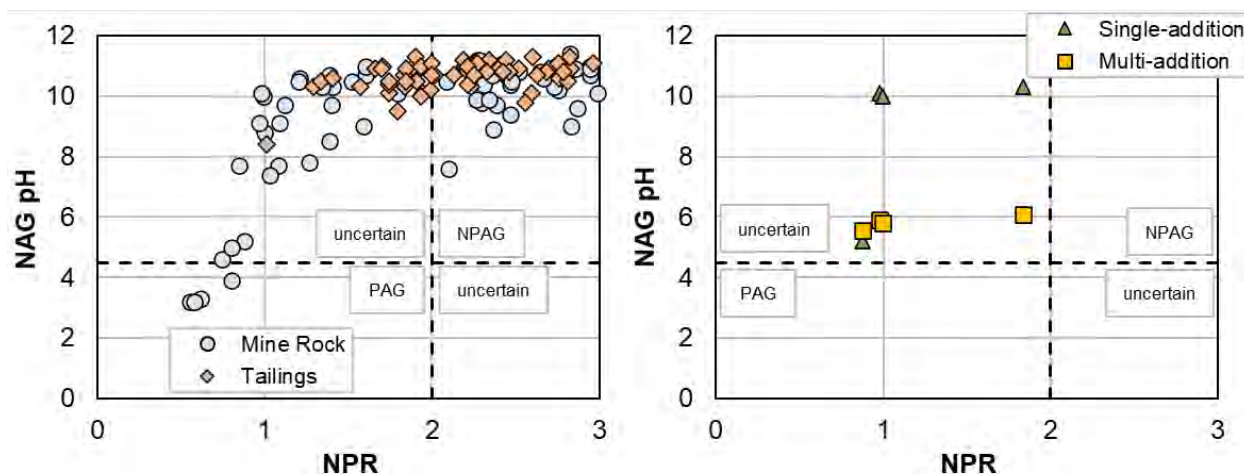


Figure 2: Left: NPR versus NAG pH in 2020 ML/ARD monitoring samples from the Touquoy Mine. Right: Comparison of single- and multi-additional NAG test results conducted on a subset of samples. Thresholds for the discrimination between PAG and NPAG samples are NPR = 2 and NAG pH = 4.5.

Aqua regia digestible metal contents may be used to screen for parameters of potential environmental concern. The degree of enrichment as compared to average upper crustal abundance (AUCA; Rudnick and Gao, 2014) can provide a general indication of the metal inventory in the solid-phase. A threshold of $>10 \times$ the respective AUCA was used to define an elevated metal content. For the Touquoy operational monitoring samples, arsenic was the only species detected above the analytical detection limit that commonly showed enrichment in the solid-phase and did so in 87% of all samples submitted for solid-phase metals analysis in 2020. Arsenic is known to be elevated in geological materials in the Meguma Terrane and across large parts of Nova Scotia. It is however important to note that solid-phase enrichment does not necessarily indicate that the element will become problematic in mine drainage. Conversely, metals that do not show enrichment based on this screening method may still become an environmental concern in mine-affected drainage as pH and redox conditions tend to control the mobility of a metal in addition to the solid-phase abundance.

2.1.2 Tailings

Fifty-five (55) tailings samples were submitted for geochemical testing in 2020, eleven of which (20%) are classified as PAG with an NPR <2 , while 28 samples showed an NPR falling between 2 and 3. No tailings sample was found to have an NPR <1 and therefore modified NP exceeds AP in all samples tested. The total range of NPR values for the tailings population spans from 1.6 to 5.7 (Table 1). The PAG proportion of 20% has decreased since 2019 where 50% of tailings samples were classified as PAG (Lorax, 2020). No tailings sample was conclusively identified as PAG by the single- or multi-addition NAG test (Figure 2).

Screening the tailings solid-phase composition against the AUCA (Rudnick and Gao, 2014) defined in the previous section revealed elemental enrichments consistent with those observed in the mine rock sample population. Only As exceeded the screening threshold of 10 x the AUCA for any elements that were measured above the analytical detection limit, consistent with results presented for mine rock samples. These results are also consistent with monitoring data collected in previous years.

2.2 Shake Flask Extraction Tests

A subset of waste rock samples that may be used for construction is required to undergo testing to determine their metal leaching potential provided the material is used outside the TMF drainage catchment (NSE, 2018). The “*Blast Material Sampling and Handling (Rev.2)*” procedure (AMNS, 2019) specifies that one composite sample be submitted for metal leaching testing per 100,000 t of construction material. In 2020, a total of 24 blast rock samples were submitted for SFE testing. The total tonnage of waste rock used for construction during that time amounted to 567,000 t and as such, a higher than recommended sample frequency was achieved. It should further be noted that only a relatively small portion of all waste rock mined was used for construction purposes outside the TMF drainage catchment.

All samples produced neutral to alkaline pH values in the test extracts ranging from 7.6 to 9.2 with a median of 8.5. This is consistent with the SFE pH values reported for previous years (Lorax, 2020) and confirms that none of the samples with an NPR <3 are actively acid-generating. Figure 3 plots NPR versus SFE pH for mine rock produced since mining commenced and illustrates that there is no relationship between the two parameters.

Arsenic is the primary parameter of concern from a water quality perspective and ranges in concentration from 0.0036 to 0.71 mg/L with a median 0.056 mg/L in 2020 SFE tests. This median value is lower than that calculated for the 2019 database (0.071 mg/L, Lorax 2020). In agreement with findings from previous ML/ARD monitoring, there is only a weak correlation between the aqueous As concentrations and the corresponding solid-phase As contents across the datasets, although samples leaching the highest As concentrations generally also exhibit higher solid-phase As contents (Figure 3).

3. Conclusions & Recommendations

Based on the ML/ARD monitoring data available to date, the following conclusions and recommendations are made:

- The operational ML/ARD monitoring program implemented by AMNS is currently in compliance with the sampling frequency requirements established in the IA based on the number of monitoring samples.

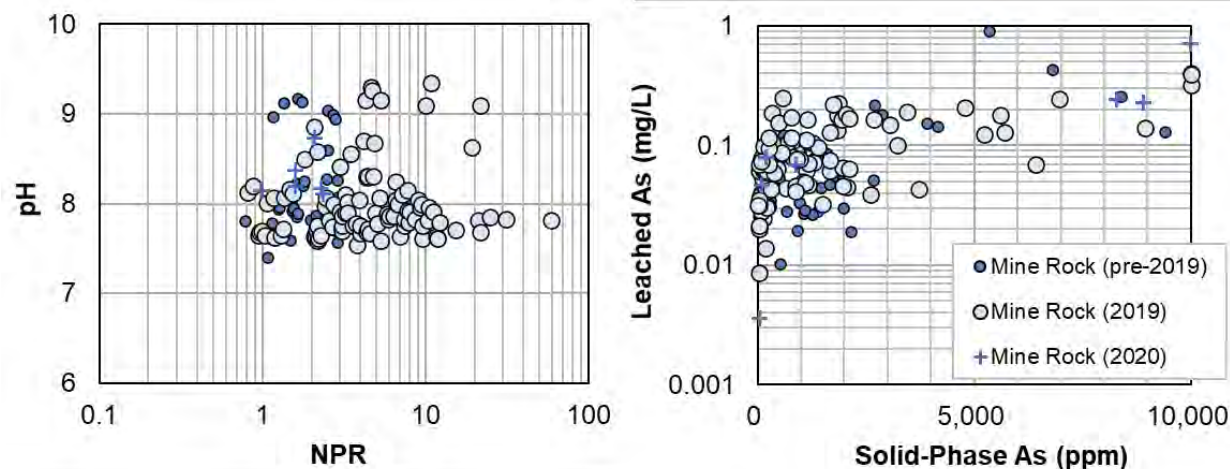


Figure 3: SFE pH versus NPR (left) and leachable As concentrations versus solid-phase As (right) in ML/ARD monitoring samples from the Touquoy Mine.

- The Touquoy operational ML/ARD monitoring data suggests that 16% of all mine rock samples collected in 2020 are PAG (NPR <2). This represents a reduced proportion compared with the ML/ARD monitoring data from 2019 where 21% of mine rock was classified as PAG. A significant reduction in the PAG propensity from 50% to 20% over the same time period was also observed for tailings samples.
- Confirmatory NAG testing yielded a much smaller PAG proportion conclusively where only four (4) of the 65 tested mine rock samples showed a NAG pH of <4.5. None of the tailings samples submitted for NAG testing yielded a NAG pH of <4.5. Validation of the single-addition NAG test with the more aggressive multi-addition NAG test yielded consistent results with respect to the NPAG designation of the tested samples (n = 4).
- SFE testwork has produced circum-neutral pH values for all tested 2020 waste rock samples suggesting that there is no immediate ARD risk due to the presence of NP. Exposure of low-NPR mine rock and tailings materials may nevertheless generate acidic drainage in the long-term if left unmitigated.
- In response to an NSE directive (NSE, 2021) mandating additional PAG management planning, Lorax was retained by AMNS to develop a PAG water quality model to evaluate the long term potential for ARD from the Touquoy WRSA. This exercise will be supported by a verification ML/ARD drilling program that was conducted in early 2021 and will inform the need for additional mitigation strategies (*e.g.*, dry cover) as well as reclamation planning.

4. Closure

This technical memorandum was prepared for the exclusive use of AMNS to provide an overview of the available operational ML/ARD monitoring data. Please contact the undersigned should you have any questions or comments.

Lorax Environmental Services Ltd.

Prepared by:

Reviewed By:



Signature: T. Kirchner
Date: Apr. 15, 2021

Timo Kirchner, M.Sc., P.Geo. (BC, NS)
Environmental Geoscientist

Bruce Mattson, M.Sc., P.Geo.
Principal, Senior Geoscientist

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April 15, 2021

Atlantic Mining NS Corporation
409 Billybell Way,
Mooseland, Nova Scotia,
Canada B0N 1X0

Attention: Melissa Nicholson, Laura Struthers

Re: 2020 Review of the Touquoy Operational ML/ARD Monitoring Procedure

Under the amended Industrial Approval (IA) # 2012-084244-05 issued by Nova Scotia Environment (NSE) in July 2018, Atlantic Gold is required to undertake operational monitoring to assess the risk of metal leaching and acid rock drainage (ML/ARD). Section 19b. ii) of the IA states that *“A revised Blast Material Sampling Procedure that addresses the Departments comments sent in April 2017 shall be prepared by a professional geochemist. [...] This Blast Material Sampling Procedure shall be reviewed and updated annually by a Professional Geochemist and a copy provided to the Department with the Annual Report”*. Lorax Environmental Services Ltd. (Lorax) acts as the professional geochemist for the Touquoy project to conduct the annual review of any relevant procedures. Currently, Atlantic Gold conducts operational ML/ARD monitoring using two separate standard operating procedures (SOPs), namely i) Blast Material Sampling and Handling (*AGC-PRO-GEO-007; Rev. 3*) and ii) Tailings Solids Sampling (*AT-PRC-PRO-8027; Rev. 4*). This letter confirms the annual review of both of these SOPs for 2021.

The procedure document components reviewed include:

- General wording and accuracy of background information;
- Method of sample collection and number of samples collected;
- Analytical test methods chosen;
- Geochemical classification of tested materials;
- Reporting of geochemical results; and
- General adherence to the Touquoy ML/ARD Management Plan.

In consideration of the requirements outlined in the IA and Nova Scotia’s Sulphide Bearing Material Disposal Regulations, both SOPs are deemed up to date and adequate for their intended purpose.

Respectfully,



Signature: T. Kirchner
Date: Apr. 15, 2021

Timo Kirchner, M.Sc., P.Geo. (BC, NS)
Environmental Geoscientist

ATLANTIC MINING NS INC.

Tailings Solids Sampling

AT-PRC-PRO-8027

Document Owner	Mill Manager		
Date Originated	27-Sep-18		Approval Date
Deployment Date			Archive Date
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Document Name Tailings Solids Sampling	Document Number AT-PRC-PRO-8027	Page 2 of 7
Revision 5	Next Review Date	27-Apr-21

1 PURPOSE AND SCOPE

This procedure is intended to instruct the user how to perform Tailings Solids Sampling. This sampling is conducted to identify whether rock material has the potential for metal leaching (ML) and acid rock drainage (ARD). ML and ARD are naturally occurring processes which can be accelerated during mining and may have negative impacts on the receiving environment if they occur in the absence of adequate neutralization, dilution and/or attenuation. ARD occurs when sulphide minerals and elemental sulphur are exposed to the weathering effects of oxygen and water. Acidity is generated from the oxidation of sulphur and the precipitation of ferric iron. ARD occurs when the resulting acidity is entrained by water. At the Touquoy Pit and adjacent area, there is a naturally high concentration of calcite and dolomite in the rock which is an important factor in neutralizing ARD.

Industrial Approval (IA) No. 2012-084244-05 (Section 19) outlines the requirements regarding Blast Material Sampling and management of waste rock:

19. Acid Rock Drainage Contingency

b. i) The Approval Holder shall collect and analyze samples of fresh waste rock from the open pit mine and tailings for at least every 100,000 tonnes of ore mined. Samples from the TMF quarry shall be collected and analyzed for at least every 20,000 tonnes of rock quarried. Sampling and analyses shall otherwise be conducted in accordance with the approved Blast Material Sampling procedure as updated from time to time. Samples shall be analyzed for acid base accounting, total sulphur and percent sulphide.

ii) A revised Blast Material Sampling Procedure that addresses the Departments comments sent in April 2017 shall be prepared by a professional geochemist. The revised Procedure shall be submitted to the Department for review by August 1, 2018. This Blast Material Sampling Procedure shall be reviewed and updated annually by a Professional Geochemist and a copy provided to the Department with the Annual Report.

iii) The B.C. Confirmation Test or alternate acceptable acid rock drainage kinetic testing shall be conducted on all samples which have an acid consuming to acid generating ratio of 3:1 or less.

c. Should the results of testing indicate potentially acid generating conditions the Approval Holder shall notify the Department immediately and may be required to conduct additional monitoring/testing or implement a plan to monitor and mitigate potential acid mine drainage, if so directed by Department.

d. A summary of the results of acid rock drainage testing shall be provided with the annual report required in Condition 12.

This Standard Operating Procedure (SOP), herein, describes the method of tailings sampling in the Tailings Management Facility (TMF). Specifically, this document describes:

- The method for sample collection, and submission of the samples for select laboratory analyses.
- The criteria for identifying potentially acid generating (PAG) material based on analytical testing.

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2 REQUIREMENTS

2.1 Permits/Special Equipment/Additional PPE

1. Mill PPE – Hardhat, safety glasses, reflective shirt/vest, gloves, steel toe boots
2. Task specific PPE – HCN badge, nitrile gloves
3. Additional task specific PPE as required by SDS or deemed necessary for safe operating practice

2.2 Training and/or Qualification Requirements

1. Mill Basic Common Core
2. Be trained by Atlantic Gold qualified personnel to perform the task and SOP review
3. SOP review and signed acknowledgement
4. JHA review and signed acknowledgement
5. Relevant SDS reviewed
6. WHMIS

3 DEFINITIONS

FLRA	A Field Level Risk Assessment is a form that is completed prior to work commencing. It is designed to identify hazards, assess risk and control exposure to them before a qualified person begins to perform a task.
Start Safe Card	A Start safe card is a risk assessment form that is completed prior to a new task being performed. It is a tool to identify hazards, assess risk, manage hazards, and determine if further instructions are necessary prior to assigned tasks are performed.
JHA	A Job Hazard Analysis is a technique to identify the dangers of a specific task in order to reduce the risk of injury to workers.
Personal Protective Equipment (PPE)	Equipment or clothing such as but not limited to, hard hats, safety glasses, reflective clothing/coveralls, gloves, steel toe safety boots, earplugs, lifejackets, fall protection and respirators worn by workers to help protect them from workplace hazards.
Qualified Person	Qualified because of the person's knowledge, training and experience to design, organize, supervise and perform the duties for which the person is appointed. Be familiar with the provisions of Nova Scotia's Occupational Health and Safety Act and regulations that apply to the duties for which the person is appointed. Be capable of identifying any potential or actual danger to health or safety in the workplace.
Neutralization Potential (NP)	A general term for a material's capability to neutralize acidity.

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Acid Potential (AP)	The potential for acid generation from a sample, generally based on the sulphide sulphur content of the sample.
Acid Base Accounting (ABA)	Suite of chemical analyses tested by an accredited laboratory to determine whether a material sample is NPAG or PAG. Includes NP, AP and NPR.
Net Acid Generating (NAG) Test	Quantifies the relative amounts of acid producing and neutralizing phases in a sample upon complete oxidation of all sulphide minerals.
Neutralization Potential Ratio (NPR)	The likelihood of a sample to generate acidity as calculated by the ratio of NP/AP. Generally, a sample is classified as PAG if the NPR <2.
Non-Potentially Acid Generating (NPAG) Waste Rock	Any rock with a sulphur content of less than 0.4% and an NPR value of ≥ 2 . This is considered "clean waste rock" which can be used for construction or other purposes.
Potentially Acid Generating (PAG) Waste Rock	Any rock with a sulphur content of greater than 0.4% and an NPR value of less than 2. PAG waste rock must be managed as per the requirements of this SOP.

4 ROLES AND RESPONSIBILITIES

Position Responsible	Function/Tasks
Chief Metallurgist	<ul style="list-style-type: none"> Review and update procedure
Metallurgist	<ul style="list-style-type: none"> Review and update procedure Assist Metallurgical Technician in the undertaking of this procedure
Metallurgical Technician	<ul style="list-style-type: none"> Perform tailings solid sample following this procedure
Environment	<ul style="list-style-type: none"> Review and interpretation of ABA test results and reporting of results to Nova Scotia Environment (NSE) as required
Health & Safety	<ul style="list-style-type: none"> Review and audit procedure Act as a Health and Safety resource support

5 EXEMPTIONS

None

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6 PROCEDURE

Samples of tailings are collected from the TMF for at least every 100,000 tonnes of ore mined. The procedure outlined in this section is a systematic way of collecting the tailings solid sample.

6.1 Collecting Tailings Sample

1. Gather an aluminum sampler and 5-gallon bucket.
2. Position sampler in the front of material discharging onto the carbon safety screen at Mill Tailings Building.
3. Fill the sampler with 1 liter of discharging slurry and empty into the clean 5-gallon bucket. Continue this process to gather 4 liters into the bucket.
4. Seal the bucket with a cover and transport to the Assay Lab.
5. Clean and store sampler.

6.2 Filtering Tailings Sample

1. Gather mixing drill, 38.5cm filter paper, and Buckner funnel.
2. Assemble the Buckner funnel and insert the vacuum pump line up to the funnel.
3. Wet the 38.5cm filter paper using de-ionized water and place into the top of the funnel.
4. Turn the vacuum pump on using the switch on the top of the pump.
5. Uncover the bucket and homogenize the sample using the mixing drill.
6. Pick up the homogenized sample and pour into the funnel, ensure sample does not overflow the filter paper or the funnel.
7. Continue to homogenize and pour the remainder of the sample into the Buckner funnel as the liquid is filtered out.
8. Using de-ionized water ensure to wash any remaining solids from the bucket into the Buckner funnel.
9. Once all the solution has been filtered through the solids turn the pump off and disconnect the vacuum hose from the funnel.
10. Using the edges of the exposed filter paper lift the sample out of the funnel and place in bag for submission.
11. Clean the funnel and store appropriately.

6.3 Sample Submission, Data Interpretation and Reporting

All samples are delivered to an accredited analytical laboratory (e.g., ALS Global) for ABA including total sulphur, sulphate sulphur, calculated sulphide sulphur, and modified NP analysis.

Any sample with an NPR of less than 3:1 will trigger additional geochemical testing to further assess the ARD potential of that sample. The test method chosen for this purpose is the Net Acid Generation (NAG) test.

Review and interpretation of the tailings analytical results is completed by the Environment Department with the aid of an independent professional geochemist as required. Based on review, the result may trigger the implementation of a plan to further monitor/verify the initial results or

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develop a plan to mitigate potential acid mine drainage. An overall summary of the results of the ARD and ML testing will be provided to NSE with the annual report. Any results that come back as PAG will be reported to NSE without delay as per the Industrial Approval.

7 REFERENCES

None

8 DOCUMENT REVISION HISTORY

Revision Events

Rev.	Author	Changes	Date
A	KM	Title page, headers, footers	24-Jan-20
1	RK	Requirements	27-Jan-20
2	LS	Definitions, Sample Submission	21-Apr-20
3	KM	Reformatted, added hyperlinks	28-May-20
4	BW	Added definition	1-Mar-21
5	LS	All sections	21-Apr-21

9 APPENDIX

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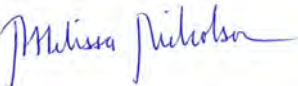


ATLANTIC GOLD CORPORATION

Blast Material Sampling and Handling

AGC-PRO-GEO-007

Approved By: 
Name: Drew Pelley
Function: Superintendent Mine Geology
Date: 2021-04-28

Approved By: 
Name: Melissa Nicholson
Function: Environmental Superintendent
Date: 2021-04-28

DOCUMENT REVISION RECORD

Pages affected by the current revision are listed in the table below and are identified by hash marks (lines) on the right side of the affected pages.

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1 PURPOSE AND SCOPE

Blast material sampling is conducted to identify whether mine rock material has the potential for metal leaching (ML) and acid rock drainage (ARD). ML and ARD are naturally occurring processes which may have negative impacts on the receiving environment if they occur in the absence of adequate neutralization, dilution and/or attenuation. ARD occurs when sulphide minerals are exposed to the weathering effects of oxygen and water. ARD is generated from the oxidation of sulphur and the precipitation of ferric iron. At the Touquoy Pit and adjacent area, there is a naturally high concentration of calcite and dolomite in the rock which is an important factor in neutralizing ARD.

Industrial Approval (IA) No. 2012-084244-05 (Section 19) outlines the requirements regarding Blast Material Sampling and management of waste rock and quarry rock:

19. Acid Rock Drainage Contingency

b. i) The Approval Holder shall collect and analyze samples of fresh waste rock from the open pit mine and tailings for at least every 100,000 tonnes of ore mined. Samples from the TMF quarry shall be collected and analyzed for at least every 20,000 tonnes of rock quarried. Sampling and analyses shall otherwise be conducted in accordance with the approved Blast Material Sampling procedure as updated from time to time. Samples shall be analyzed for acid base accounting, total sulphur and percent sulphide.

ii) A revised Blast Material Sampling Procedure that addresses the Departments comments sent in April 2017 shall be prepared by a professional geochemist. The revised Procedure shall be submitted to the Department for review by August 1, 2018. This Blast Material Sampling Procedure shall be reviewed and updated annually by a Professional Geochemist and a copy provided to the Department with the Annual Report.

iii) The B.C. Confirmation Test or alternate acceptable acid rock drainage kinetic testing shall be conducted on all samples which have an acid consuming to acid generating ratio of 3:1 or less.

c. Should the results of testing indicate potentially acid generating conditions the Approval Holder shall notify the Department immediately and may be required to conduct additional monitoring/testing or implement a plan to monitor and mitigate potential acid mine drainage, if so directed by Department.

d. A summary of the results of acid rock drainage testing shall be provided with the annual report required in Condition 12.

This Standard Operating Procedure (SOP), herein, describes the method of blast material sampling in the Touquoy Open Pit and the Tailings Management Facility (TMF) Quarry. The methodology for tailings sampling is described under a separate SOP (AGC-PRO-MILL-951). Specifically, this document describes:

- The method for sample selection, sample collection, and submission of the samples for select laboratory analyses.
- The criteria for identifying potentially acid generating (PAG) material based on analytical testing.
- Handling and management of PAG material if identified.

2 REQUIREMENTS

2.1 Permits/Special Equipment/Additional PPE

- Clean shovel.
- Plastic heavy-duty rock sampling bags.
- Permanent marker.
- Field book
- Map of blast hole pattern for making notes and comments

2.2 Training and/or Qualification Requirements

- The work covered by this SOP will be performed by each responsible department following AMNS's Health, Safety and Environment policies and procedures including the use of personal protective equipment (PPE), following safe work practices/procedures, and completing assessment of hazards and controls.
- SOP review and signed acknowledgement.

3 ROLES AND RESPONSIBILITIES

Mine Geology	<ul style="list-style-type: none"> • Review procedure with all employees who will be utilizing the procedure and ensure that it is understood. • Ensure compliance with the procedure. • Responsible for evaluation of density and sampling required to determine the quality of material in the blast area. • Delivers samples to in-house lab for sulphur testing for preliminary determination of PAG material. • Provides guidance to Mine Operations regarding material classification and potential.
Mine Engineering/Operations	<ul style="list-style-type: none"> • Review procedure with all employees who will be utilizing the procedure and ensure that it is understood. • Ensure compliance with the procedure. • Responsible for planning blast patterns and overseeing blasting activities. • Carrying out the dig plans as specified by the geology and mine engineering departments, • Responsible for handling of materials based on classification and potential for acid generation.

Environment	<ul style="list-style-type: none"> • Review procedure with all employees who will be utilizing the procedure and ensure that it is understood. • Ensure compliance with the procedure. • Review and audit the procedure on an annual basis. • Shipping samples to an accredited facility for analytical testing outlined in this procedure. • Responsible for providing review and interpretation of the ABA test results. • Reporting of results to Nova Scotia Environment (NSE) as required. • Notifying Mine Operations if PAG material is identified.
Health & Safety	<ul style="list-style-type: none"> • Act as health and safety resource support.

4 DEFINITIONS

Blast hole samples: samples collected from drill cutting cones.

Neutralization Potential (NP): A general term for a material's capability to neutralize acidity.

Acid Potential (AP): The potential for acid generation from a sample, generally based on the sulphide sulphur content of the sample.

Acid Base Accounting (ABA): Suite of chemical analyses tested by an accredited laboratory to determine whether a material sample is NPAG or PAG. Includes NP, AP and NPR.

Net Acid Generating (NAG) Test: Quantifies the relative amounts of acid producing and neutralizing phases in a sample upon complete oxidation of all sulphide minerals.

Neutralization Potential Ratio (NPR): The likelihood of a sample to generate acidity as calculated by the ratio of NP/AP. Generally, a sample is classified as PAG if the NPR <2.

Non-Potentially Acid Generating (NPAG) Waste Rock: Any rock with a sulphur content of less than 0.4% and an NPR value of ≥ 2 . This is considered "clean waste rock" which can be used for construction or other purposes.

Potentially Acid Generating Waste (PAG) Waste Rock: Any rock with a sulphur content of greater than 0.4% and/or an NPR value of less than 2. PAG waste rock must be managed as per the requirements of this SOP.

Shake Flask Extraction (SFE): A short term test designed to show metal leaching behaviour of a sample.

5 PROCEDURE

5.1 SAMPLING PROTOCOL

Samples of fresh waste rock are collected from the open pit mine for at least every 100,000 tonnes of ore mined. Samples from the TMF Quarry are collected and analysed for at least every 20,000 tonnes of rock quarried. The sampling protocol for waste rock and quarry rock is detailed in the sections below.

5.1.1 Open Pit Mine Material Type Classification

Material type classification is determined by the mine geology department using spatial and chemical data obtained through blast hole sampling and surveying procedures. Material is classified as either ore or waste as determined by the grams of gold per tonne of material and the current mine economics. Ore is typically classified as low, medium, or high grade for the purpose of material handling and storage.

5.1.2 Blast Hole Sample Selection

Prior to each blast, blast holes are drilled on a grid to distribute explosives throughout the rock volume. During blast hole drilling, air is used to clear cuttings away from the drill bit which are returned to surface and deposited in a pile next to the blast hole. Drill cuttings are ideal for blast material sampling since they provide representative fine-grained material from the entire volume to be blasted.

The mine geology department subdivides each planned blast into mineable blocks of ore and waste based on the estimated grades. Ore and waste blocks are then subdivided into sections of 10-25 blast holes for sampling, where each section is represented by one composite sample collected from several blast holes within the block. Typically, given a 10m blasting height, cuttings from one blast hole represents between 300 and 400 tonnes of in situ material. This sample frequency satisfies the IA requirements for sample frequency and other requirements as outlined in IA Section 19.

Samples are assigned a unique sample IDs based on the blast ID number. Records of which blast holes are represented by each sample are retained by the Mine Geologist.

5.1.3 Blast Hole Sample Collection

Once drilling of the blast hole is completed, a member of the Mine Geology department will collect the samples from the selected blast holes. Using a small metal hand scoop, each quadrant of the resulting drill cuttings cone is sampled in a cross-sectional fashion.

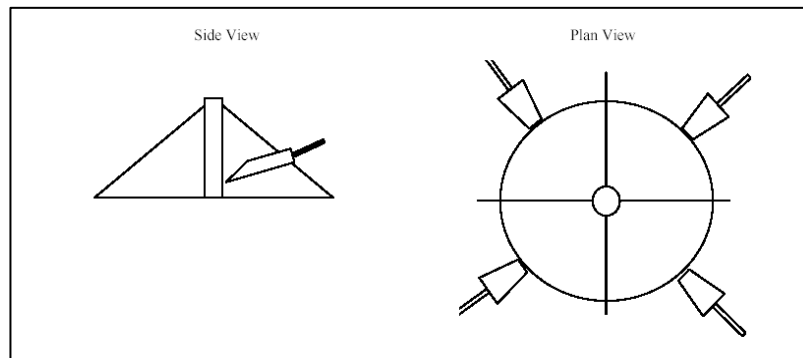


Figure 1. Manual sample collection.

To collect a representative sample from the blast hole cuttings pile:

1. Insert the scoop at approximately $\frac{1}{2}$ the height of the pile and angled downward.
2. Withdraw the scoop slowly in an upward motion to the top of the pile.
3. Carefully empty the scoop into the sample bag, ensuring that none of the sample is spilled.
4. Repeat steps for the remaining three quadrants, ensuring that the locations in each quadrant are replicated and equal amounts are extracted.

5.1.4 Sample Submission and Geochemical Analysis

All waste rock samples are to be submitted to the Atlantic Gold laboratory for in-house sulphur testing. Once analysed these samples are delivered to an accredited analytical laboratory (e.g., ALS Canada Ltd.) for ABA including total sulphur, sulphate sulphur, calculated sulphide sulphur, and modified NP analysis. Shake Flask Extraction (SFE) is to be performed on any material that is considered as construction fill, with one composite sample per 100,000 tonnes of construction rock material. This will satisfy the need to test for metal leaching potential.

Any sample with an NPR of less than 3:1 will trigger additional geochemical testing to further assess the ARD potential of that sample. As such, these samples will be sent for the Net Acid Generating (NAG) test.

5.2 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

QA/QC measures will be implemented during both the sampling and the geochemical analysis of the blast hole materials. The sampling QA/QC protocol will include the collection of a replicate sample for every 10th blast hole monitoring sample. The sample collection procedure will be identical to that for the original sample.

Laboratory QA/QC measured will include the implementation of analytical duplicates and the use of certified reference materials (CRM).

5.3 DATA MANAGEMENT, INTERPRETATION AND REPORTING

5.3.1 Data Management

The blast material sample information is recorded by the Mine Geology Department. The sample information includes:

1. Blast ID
2. Bench, Material Classification and quantity
3. Location of selected blast holes (for sampling)
4. Sample ID and date
5. Location (North, Easting and Elevation)
6. Any Comments

5.3.2 Data Interpretation and Reporting

Review and interpretation of the blast material analytical results is completed by the Environment Department with the aid of an independent professional geochemist as required. Standard practice calls for the PAG classification based on sulphur and NPR. The general cut-off parameters for PAG rock classification are $S > 0.4\%$ and/or $NPR < 2$. For the purposes of this SOP, it is noted that the IA stipulates that additional testing (e.g., NAG testing) should be completed for any blast rock sample with an $NPR < 3$.

For $NPR < 2$, the rock will be considered PAG. This result may trigger the implementation of a plan to further monitor/verify the initial results. Should the results of the ABA testing indicate that the material has an NPR below 3, the test results including those for the kinetic testing will be reviewed by an independent professional geochemist for an assessment regarding PAG characteristics and metal leaching susceptibility. Based on this assessment, NSE will be notified of any recommendations for mitigation (if required).

An overall summary of the results of the ARD and ML testing will be provided to NSE with the annual report. This summary will include an analysis of the ML/ARD potential in relation to the blast hole material information recorded during the sampling process (e.g., geology, location, grade, etc.).

5.4 MATERIAL HANDLING

There are four material types expected as a result from the operation: ore, quarry rock (suitable for construction), clean waste rock or PAG waste rock. Material is stored based on classification. Separate stockpiles are created for quarry rock, waste rock and ore. All waste material and quarry rock is managed in a precautionary manner in case future testing reveals that additional management measures are required. Blast rock material (including mine waste rock and quarry rock) is placed in the waste rock storage area and tracked so that it can be located and managed if required. **PAG material is identified prior to deposition in the waste rock storage area so that**

it can be properly managed. All material will be managed as per the Touquoy Mine ML/ARD Management Plan.

Identified PAG material will be confirmed by means of additional sampling and analyses under the direction of a professional geochemist. If the material is confirmed to be PAG, then its location within the waste rock storage facility will be identified and the PAG material will be managed as required, based on guidance from a team consisting of a professional geochemist and geotechnical/civil engineer.

6 REVIEW

As per IA Condition 19B ii, this SOP must be updated annually and reviewed by a Professional Geochemist. A copy of this SOP must be provided to Nova Scotia Environment with the Annual Report.

TECHNICAL MEMORANDUM

To: Laura Struthers, Melissa Nicholson, Ryan Keating; Atlantic Mining

Date: December 4, 2020

From: Jennifer Stevenson, Timo Kirchner

Project #: A563-3

Subject: Touquoy Mine Verification Monitoring Work Plan

1. Introduction

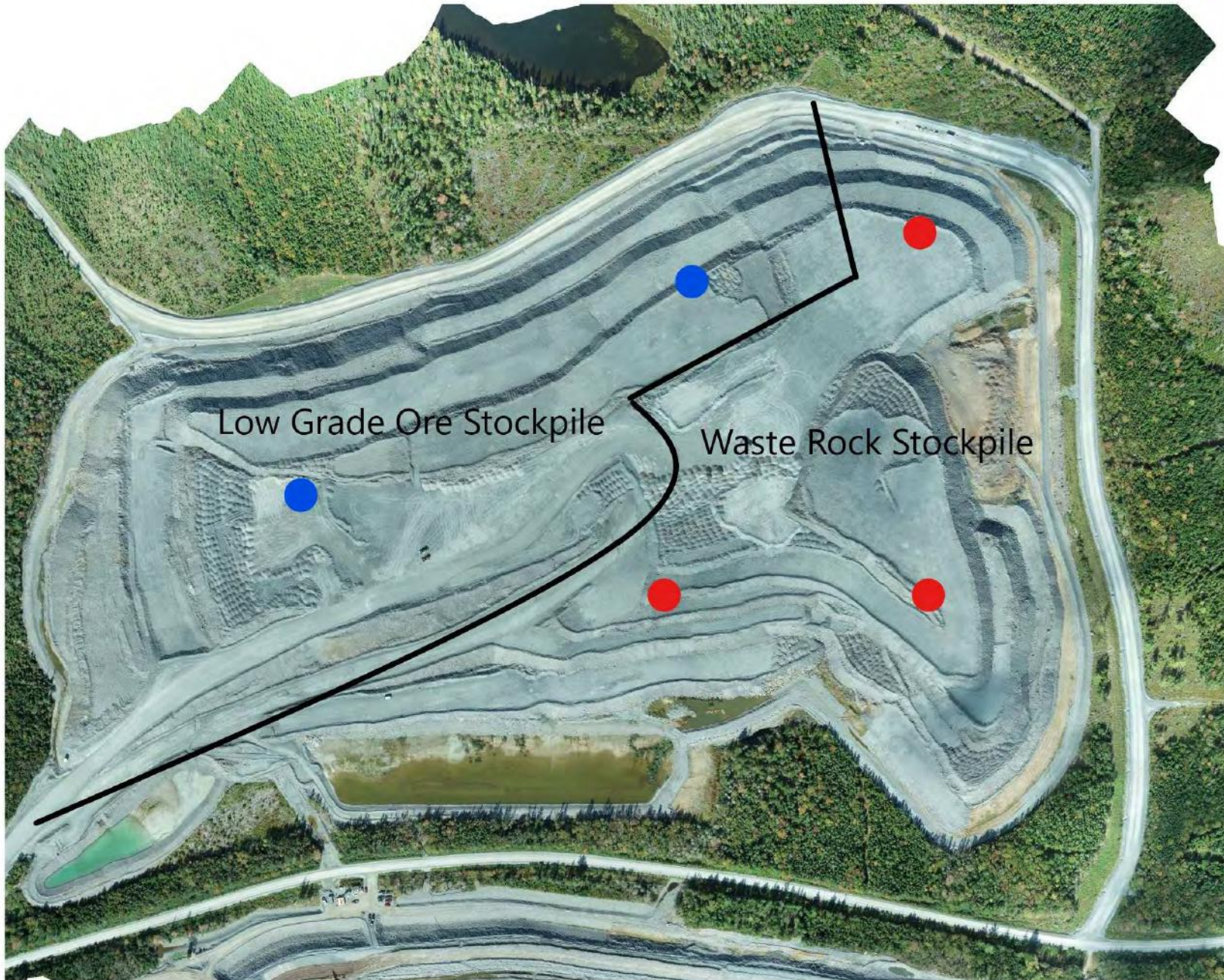
Geochemical sampling at the Touquoy Mine has indicated that although the sulphide contents of the excavated rock are relatively low (typically <1%), there is some potential for metal leaching/acid rock drainage (ML/ARD). Potentially Acid Generating (PAG) rock is defined as material with a neutralization potential ratio (NPR) below 2, while samples with $\text{NPR} \geq 2$ can be considered Not Potentially Acid Generating (NPAG). This is consistent with the recommendations in Price (2009). In the initial geochemical characterization (Golder, 2007), <10% of the samples collected were classified as PAG. Operational ML/ARD monitoring has shown an increasing trend in the proportion of PAG samples ($\text{NPR} < 2$) over time, reaching up to >20% in blasted rock from the Touquoy pit (Lorax, 2019, 2020a). All samples with $\text{NPR} < 3$ have been submitted for the net acid generation (NAG) test (Smart et al., 2002) as an additional check on the ARD potential of the material and the NAG test generally indicates that the samples are NPAG. However, to understand the distribution of PAG rock within the waste rock storage area (WRSA) and low-grade ore (LGO) stockpile, verification monitoring is proposed for previously placed material in order to confirm its geochemical character. This will help understand the effectiveness of operational mixing of PAG and NPAG rock and guide the implementation of future mitigation strategies.

This work plan provides an outline of the recommended steps for verification monitoring to ensure that the sample distribution and analysis is sufficient to adequately characterize the material previously deposited in the stockpiles. Recommendations for confirmatory monitoring for future material placement are also provided.

2. Proposed Verification Monitoring Plan

2.1 Proposed Sample Locations

In support of the verification monitoring, four Reverse Circulation (RC) drill holes are proposed within the WRSA and one drill hole is proposed in the LGO stockpile (Figure 2-1). The proposed drill hole locations are provided in Table 2-1. These locations may be modified as access allows; however, the drill hole locations should be selected to provide a reasonable spatial distribution over the WRSA and LGO stockpile area. The stockpile has an average thickness of 14 m; however, the thickness varies from 9 to 25 m. The depth of each drill hole will be determined in the field based on the depth at which the clay layer at the base of the stockpile is encountered. Drill hole samples should be collected and composited over intervals of 2 m or less to allow for sufficient spatial resolution of PAG zones. Each sample should comprise a minimum of 2 kg.



LEGEND

- Proposed Low Grade Ore Drill hole Location
- Proposed Waste Rock Drill hole Location

DATE SAVED: Dec 03, 2020

DRAWN BY:

REVIEWED:

VERSION:

CLIENT:



ATLANTIC GOLD



PROJECT:

**Touquoy Mine Verification
Monitoring Work Plan**

TITLE:

Proposed Drill Hole Locations

PROJECT #: A563-3

FIGURE: 2-1

**Table 2-1:
Proposed Drill Hole Locations**

Proposed Drill Hole	Easting	Northing
<i>Waste Rock Storage Area</i>		
WRSA-01	506246	4982039
WRSA-02	506254	4981761
WRSA-03	506027	4981732
<i>Low Grade Ore Stockpile</i>		
LGO-01	505664	4981819
LGO-02	506030	4982003

Note: Locations are approximate and may change based on field conditions

2.2 Proposed Analyses

The existing geochemical database indicates that a sulphur content of 0.4% is a reliable criterion to identify PAG rock, where samples exceeding this sulphur value have a high probability of being PAG (NPR < 2; Lorax, 2019, 2020a). As such, all samples should be analyzed by the on-site laboratory for total sulphur (total S).

In addition, each sample should also be sent to an external laboratory for selected acid base accounting (ABA) analyses including paste pH, sulphate S, and modified Sobek neutralization potential (NP). A subset of samples (1 in 5 samples) should also undergo confirmatory total S analysis to validate the representativeness of the sampling method and to validate the in-house total sulphur analytical techniques. Acid potential (AP) is calculated from the non-sulphate S (total S – sulphate S). The additional geochemical parameters will be used to calculate the NPR (NP/AP) which can designate the samples as PAG (NPR < 2) or NPAG (NPR > 2).

The results will be evaluated to determine if there are any high-risk areas for ARD development within the rock piles. If this is found to be the case, additional drilling and sampling may be warranted to delineate the extent of the PAG material.

3. Future Verification Monitoring

In order to proactively monitor future placement of waste rock and low-grade ore on site, confirmatory sampling should be conducted as material is placed in the WRSA and LGO stockpile. A sampling frequency of one sample for every 400,000 tonnes of material placed is proposed. This sampling is in addition to the more frequent monitoring conducted during grade control and/or blasthole sampling as per the ML/ARD Management Plan (Lorax, 2020b). All samples should be analyzed on site for total S and sent to an external laboratory for ABA and aqua regia digestible metals. This verification monitoring program will serve to assess the effectiveness of any future PAG mitigation strategies that are selected.

4. Closure

We trust this work plan meets your present requirements. Please contact us should you have any questions or require clarification.

Regards,

LORAX ENVIRONMENTAL SERVICES LTD.

Prepared by:

Original Signed by:

Jennifer Stevenson, MSc, P.Geo.
Environmental Geoscientist

Original Signed by:

Timo Kirchner, MSc, P.Geo.
Environmental Geoscientist

Reviewed by:

Original Signed by:

Bruce Mattson, MSc, P.Geo.
Senior Environmental Geoscientist

References

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