Atlantic Gold

Appendix F.3

Fifteen Mile Stream Project Mine Rock Management Plan, Lorax Environmental Services Ltd.

Fifteen Mile Stream Project
Mine Rock Management Plan

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1. Introduction

1.1 Project Background

The Fifteen Mile Stream (FMS) project is a proposed gold mine owned by Atlantic Mining Nova Scotia Inc. (AMNS) a wholly owned subsidiary of St. Barbara Limited. The property is located in the Moose River Gold Mines District, around 100 km northeast of Halifax, Nova Scotia, and 35 km northeast of the currently operating Touquoy gold mine. The FMS project includes three zones – the Egerton Zone, the Hudson Zone, and the Plenty Zone. The Environmental Impact Statement (EIS) currently only includes development of the Egerton Zone. Based on a cut-off grade of 0.3 g/t Au, the total measured and indicated mineral resource estimates for the Egerton Zone is 14.57 Mt at a grade of 1.16 g/t Au (Atlantic Gold, 2019). The project is expected to produce 543,500 oz. of gold from this zone over the life of mine.

Geologically, the FMS deposit falls into the Meguma Terrane which hosts various gold deposits in southern and central Nova Scotia. The main geological units at the site are argillite and greywacke; however, these units are interbedded and intermediate classifications are included in between these two endmembers. Lithological codes for the main units encountered on site include ***AR*** (argillite with <5% greywacke), ***AG*** (argillite with 5-49% greywacke), ***GA*** (greywacke with 20-50% argillite), and ***GW*** (greywacke with <20% argillite). Rock with a higher proportion of argillite beds generally have a higher risk of ARD due to the higher overall sulphide content and lower neutralization potential of this unit (Lorax, 2019a).

This Mine Rock Management Plan has been prepared in support of the EIS as the need for management and monitoring of metal leaching/acid rock drainage (ML/ARD) produced by FMS mine rock and tailings is expected. This Mine Rock Management Plan is intended to be a living document and will be updated as additional geochemical data become available and/or based on the requirements by regulatory agencies.

Mine rock is herein defined as ore and waste material that is produced by blasting. While ore is either directly processed or temporarily stockpiled for later processing, waste material may be permanently stored in a Waste Rock Storage Area (WRSA) or used as construction material for site infrastructure if it meets material specifications and is classified as non-Potentially Acid Generating (NPAG).

Tailings are the fine-grained waste product of the gold concentration process which will occur at the FMS processing plant. The gold concentrate produced at site will then be transported to the Touquoy processing facility where the final processing to gold doré will take place. The tailings produced at the FMS facility will be deposited in an above-ground tailings management facility (TMF) where the bulk of the material will be stored under water-saturated conditions during operations. The TMF will then be drained after mine closure and a portion of the tailings will become exposed to atmospheric conditions. The well-mixed nature of the tailings materials along with the saturated storage conditions need to be considered when assessing the ARD potential within the TMF. The location and site layout of the FMS project are shown in Figure 1-1.

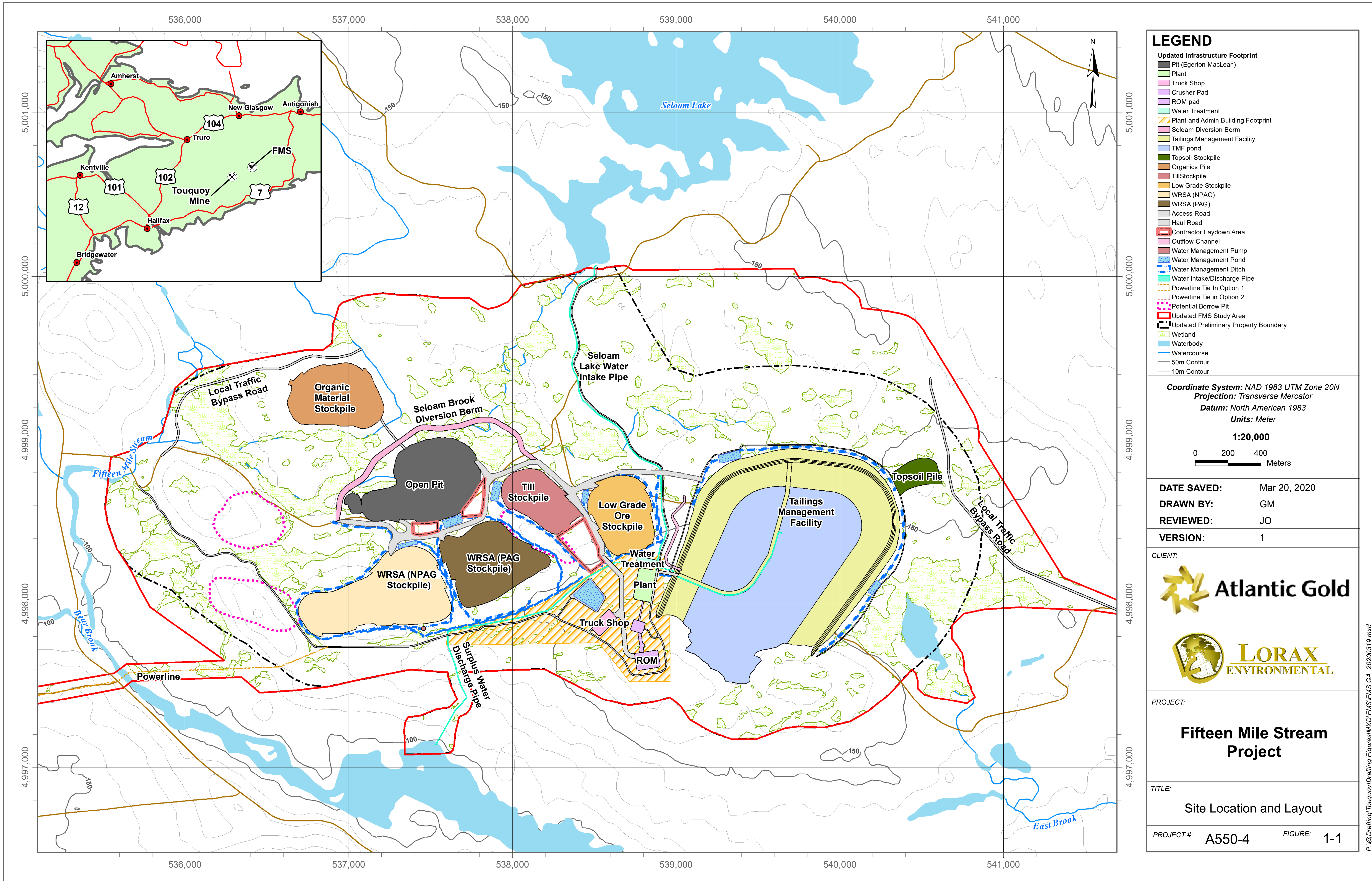
1.2 Scope and Purpose

The purpose of this Mine Rock Management Plan is to formalize monitoring procedures in place at the mine as well as to provide guidance to AMNS with respect to best practice ML/ARD mitigation strategies that may be considered should the results from the monitoring program indicate mitigation is necessary. To that end, this document is intended to serve as a geochemical reference guide for the various different activities at the mine that have a direct or indirect impact on ML/ARD-related processes. Ultimately, the Plan will allow for proactive material handling and contaminant source control to minimize mining effects on water quality and protect the downstream aquatic environment. Specific components to be discussed in this Plan include:

- ML/ARD monitoring and analysis in support of the understanding of the site's waste rock and ore classifications;
- Material handling strategies for potentially acid generating (PAG) and NPAG materials;
- Definition of materials suitable for construction of site infrastructure; and
- Verification sampling and monitoring of mine rock and tailings to test the effectiveness of the implemented mitigation measures.

1.3 Report Structure

Following the introduction and background provided in this chapter, Chapter 2 provides an overview of the classification of ML/ARD potential at FMS. Chapter 3 covers the specific roles and responsibilities of personnel involved in ML/ARD management. Chapter 4 summarizes the monitoring and management requirements for waste rock and tailings and lastly, Chapter 5 outlines the reporting requirements.



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FMS
Kentville
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101
Touquoy Mine
7
12
Halifax
Bridgewater
Seloam Lake
150
100
Seloam Lake Water Intake Pipe
Local Traffic Bypass Road
Organic Material Stockpile
Seloam Brook Diversion Berm
Fifteen Mile Stream
Open Pit
Till Stockpile
Low Grade Ore Stockpile
Tailings Management Facility
Topsoil Pile
Local Traffic Bypass Road
WRSA (PAG Stockpile)
WRSA (NPAG Stockpile)
Water Treatment
Plant
Truck Shop
ROM
Bear Brook
Powerline
Surplus Water Discharge Pipe
East Brook
N
LEGEND
Updated Infrastructure Footprint
Pit (Egerton-MacLean)
Plant
Truck Shop
Crusher Pad
ROM pad
Water Treatment
Plant and Admin Building Footprint
Seloam Diversion Berm
Tailings Management Facility
TMF pond
Topsoil Stockpile
Organics Pile
TillStockpile
Low Grade Stockpile
WRSA (NPAG)
WRSA (PAG)
Access Road
Haul Road
Contractor Laydown Area
Outflow Channel
Water Management Pump
Water Management Pond
Water Management Ditch
Water Intake/Discharge Pipe
Powerline Tie In Option 1
Powerline Tie in Option 2
Potential Borrow Pit
Updated FMS Study Area
Updated Preliminary Property Boundary
Wetland
Waterbody
Watercourse
50m Contour
10m Contour
Coordinate System: NAD 1983 UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983
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Fifteen Mile Stream Project
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Site Location and Layout
PROJECT #: A550-4
FIGURE: 1-1
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2. Classification of Acid Rock Drainage Potential

The ML/ARD potential of the various geologic materials at FMS has been previously assessed through geochemical testing (Lorax, 2019a). Both static and kinetic tests were conducted on the FMS mine rock and tailings. The results indicate that, although the sulphide contents at FMS are relatively low, there is potential for ML/ARD. This is recognized in the mine plan which provides for separate PAG and NPAG WRSAs. As such, operational ML/ARD monitoring is warranted to the demonstrate the performance of the planned material handling strategies.

The ML/ARD potential of operational monitoring samples will be classified using acid-base accounting (ABA) results. These analyses are expected to be performed both on-site for selected parameters as well as externally at an accredited laboratory. It should be noted that the on-site laboratory may be located at the Touquoy mine site.

2.1 Neutralization Potential (NP) Determination

The geochemical characterization program included both modified Sobek neutralization potential (modified NP) and carbonate neutralization potential (CaNP) (Lorax, 2019a). Modified NP provides a bulk measurement of NP. The CaNP is calculated from the total inorganic carbon (TIC) content as it is assumed that the inorganic C is present as carbonate minerals. For the purpose of this Plan it is recommended that the modified NP is used for classification of the samples. This metric is determined through a titration-based method conducted at room temperature that is not mineral-specific. Therefore, the modified NP inherently accounts for the buffering capacity from non-carbonate minerals as well as the reduced neutralization potential of Fe- and Mn-bearing carbonates (*e.g.*, ankerite, siderite). Silicate minerals that may act as neutralizing agents once carbonate phases are depleted include biotite, chlorite, and certain clay minerals.

2.2 Acid Potential (AP) Determination

The acid generating potential of a rock sample is estimated based on its sulphur content. The amount of acidity generated per mass of sulphur depends in large part on the mineralogy and solid phase speciation of sulphur. That is, different sulphide and sulphate minerals produce different amounts of acidity when weathered. The sulphide mineralogy of the FMS samples includes pyrite, pyrrhotite, chalcopyrite, and arsenopyrite, all of which generate acidity in response to oxidative weathering. Due to the lack of acidic sulphate salts in the FMS mine materials, acid potential (AP) is calculated on the basis of the sulphide sulphur content in a given sample (Lorax, 2019a). Sulphide sulphur is, in turn, conservatively calculated by subtracting the sulphate sulphur (by carbonate leach) from the total sulphur value.

The AP for the FMS mine rock is then calculated as:

$$AP\ (kg\ CaCO_3/tonne) = 31.25 \times sulphide\text{-}S\ (wt.\ \%)$$

This conversion stoichiometrically accounts for the amount of acidity released per 1% of pyrite contained in the rock material and assumes that all sulphide is available for oxidation. The AP is given in units of kg $CaCO_3$/tonne to allow the direct comparison with NP.

2.3 PAG Definition

The likelihood for a sample to generate acidity can be quantified by the comparison of NP and AP. The net potential ratio (NPR = NP/AP) represents a measure that is commonly used to identify whether a sample is PAG or NPAG. Typically, in agreement with recommendations made in Price (2009), a sample can be considered PAG if the NPR falls below a value of 2, while samples with NPR $\geq$ 2 can be considered NPAG. In other words, according to this classification the NP has to be at least twice as high as the AP in order to render a sample NPAG. This approach is conservative and accounts for the potential partial occlusion of carbonate (and other acid-buffering) minerals.

The spatial discretization of the PAG proportions was conducted through the incorporation of NPR values from the initial geochemical characterization (Lorax, 2019a) into the site's geologic block model. NPR values were interpolated across the deposit, as would be done for gold grades, and the model output was provided to the mine planning team for the calculation of PAG and NPAG tonnages. The resulting estimated proportions of PAG rock were around 12.5% of the total waste rock tonnage produced (Lorax, 2019b).

3. Planning

3.1 Roles and Responsibilities

A summary of the roles and responsibilities for the ML/ARD management sampling programs are provided in Table 3-1. Mine rock sample collection and material management should be undertaken by the mine Geologist and Mine Operations. Tailings sampling will be conducted by the metallurgists at site. The on-site analyses will include rinse pH, total S and NP. These analyses will be conducted by personnel in the on-site laboratory. The pH and conductivity monitoring of waste rock and tailings contact water should be conducted by environmental field technicians as part of a large water quality monitoring program at site. Ultimately, the Environmental Superintendent will review the ML/ARD results from the sampling programs and report to Nova Scotia Environment (NSE), if required.

Table 3-1:
Summary of Roles and Responsibilities

Department/Title	**Roles and Responsibilities**
Grade Control or Blast Hole Sampling	
Mine Geologist	• Collect grade control samples, if possible • If blast hole samples are to be collected, classify the blast material and determine the variability in geology in the blast area • Determine if the sampling density is suitable to characterize the blast • Communicate with Mine Operations & Engineering • Oversee the ML/ARD sampling program • Review and update blast materials sampling procedure in SOP • Notify Environment and Mine Operations & Engineering departments if PAG identified based on on-site sulphur and NP testing.
Mine Operations & Engineering	• Plan blasting and oversee blasting activities • Appropriate material handling for PAG and NPAG material, once classified
Health & Safety	• Review and audit Blast Hole Sampling procedure outlined in the SOP
Environment	• Review blast materials sampling procedure in SOP • Ship samples to external lab for appropriate testing • Review ML/ARD sampling results and communicate with Geology and Mine Operations and Engineering • Report results to NSE

Table 3-1 (continued):
Summary of Roles and Responsibilities

Department/Title	Roles and Responsibilities
Tailings Sampling	
Chief Metallurgist	• Review and update tailings sampling procedure in SOP
Metallurgist	• Review and update tailings sampling procedure • Assist Metallurgical Technician in the undertaking of the sampling procedure in the SOP
Metallurgical Technician	• Perform tailings solid sampling following the procedure outlined in the SOP
Health & Safety	• Review and audit Tailings Solids Sampling procedure, as outlined in the SOP
Environment	• Review tailings sampling procedure in SOP • Review ML/ARD sampling results • Report results to NSE
On-Site Analyses	
Laboratory Manager	• Review and update the rinse pH, total S, and NP on-site analytical procedures • Assist the Laboratory Technician in undertaking the analyses • Review the results of the on-site analyses and provide to Environment
Laboratory Technician	• Perform the rinse pH, total S, and NP analyses
Health & Safety	• Review and audit the analytical procedures
pH and Conductivity Monitoring	
Department/Area Supervisors	• Provide field technicians with necessary tools required to complete the work safely
Field Technician	• Collect weekly pH and conductivity measurements of drainage water pumped from the open pit (surface) mine and draining from the waste rock stockpiles • Enter field results into the database
Health & Safety	• Review and audit Surface Water Sampling procedure
Environmental Superintendent	• Maintain database for inspection by NSE, if required

3.2 Quality Assurance/Quality Control (QA/QC)

QA/QC measures will be implemented during both the sampling and the geochemical analysis of the blast hole and tailings materials. One in every 10 samples analyzed for a limited parameter suite by the on-site laboratory shall be submitted to an external laboratory for full ABA and solid phase metals. The full ABA analysis will include sulphur speciation (total S, sulphate S, and sulphide S), total inorganic carbon and modified NP. These results will be compared to the on-site analyses to ensure that the results are in good agreement.

The sampling QA/QC protocol will also include the collection of a replicate sample for every 10th blast hole monitoring sample and for every 10th tailings sample. The sample collection procedure for the replicate sample should be identical to that for the original sample. Laboratory QA/QC measures will include the implementation of analytical duplicates and the use of certified reference materials.

The field pH and conductivity probe should be properly maintained and calibrated regularly. Field QA/QC for pH and conductivity monitoring should include collecting duplicate readings at one in every ten sites. In addition, the field measurements should be compared to laboratory values when water quality samples are collected at these monitoring stations.

4. Monitoring and Management

4.1 Mine Rock

4.1.1 In-Pit Monitoring

Waste rock will be monitored by either collecting grade control samples or blast hole cuttings from within the open pit. To allow for flexibility with respect to material classification and handling, the collection and analysis of ML/ARD monitoring samples should be conducted as early as possible. Grade control samples are therefore preferable as they are generally collected well before blasting occurs and serve to produce the final definition of ore reserves. Conversely, blast holes are drilled only shortly (1 to 3 days) before a blast is executed. This type of sample is acceptable if rapid on-site testing can provide an ARD classification for the blasted mine rock before placement in designated storage areas.

The recommended minimum sampling frequencies for in-pit mine rock and construction material include:

- One sample for every 100,000 tonnes of waste rock mined in-pit; and
- One composite sample for shake flask extraction (SFE) testing per 50,000 tonnes of construction material.

ML/ARD potential for the FMS project will be determined via on-site ABA. Parameters determined as part of the operational monitoring program should, at a minimum, include:

- Rinse pH;
- Total sulphur; and
- Modified NP.

If it is not feasible to determine modified NP rapidly on-site, an NP proxy based on total C or another solid-phase species (*e.g.*, Ca) may need to be developed.

The NPR is calculated as NP/AP. For the on-site testing, total sulphur content will be used as the basis for AP and the calculation of the NPR. For the purpose of this Mine Rock Management Plan, a sample is considered PAG if it shows an NPR < 2 in accordance with recommendations made in Price (2009).

Total sulphur alone cannot be used as a proxy for characterizing material as PAG or NPAG at the FMS site. Samples classified as NPAG (NPR > 2) have a wide range of total sulphur contents (Figure 4-1). Based on the current data, PAG samples may have total sulphur content as low as approximately 0.15%. Using this value as a proxy would misclassify a large proportion of NPAG samples as PAG material. As such, both total sulphur and NP (or an NP proxy) are required to more accurately classify the material.

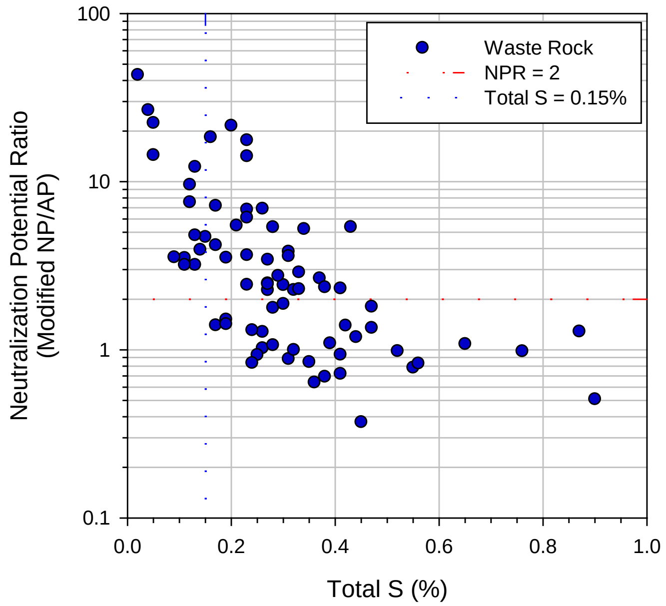

Figure 4-1: NPR versus total S in Fifteen Mile Stream waste rock samples

4.1.2 Material Handling and Management

From an environmental standpoint, three general types of material are expected to be produced during mining, namely NPAG waste rock, PAG waste rock, and ore. While ore will either be processed directly or temporarily stockpiled for later processing (if low-grade), waste material will be hauled to the WRSAs for permanent storage or used for the construction of mine infrastructure. The WRSAs were designed such that PAG and NPAG waste material are stored in separate facilities in order to better control the potential for acidic drainage and associated metal loads and mine water management. As such, material handling efforts will focus on the optimization of PAG and NPAG identification and segregation. The following provides an overview of some industry best practice measures that would apply to the FMS mine rock and tailings storage facilities.

4.1.2.1 Waste Rock

Once the geochemical character of a mining block has been determined, waste rock will be segregated accordingly and transported to the corresponding PAG and NPAG WRSAs (Figure 4-2). As mentioned previously, the timely definition of contiguous PAG zones through combined pre-mine geochemical testing along with pro-active operational

ML/ARD monitoring within the open pit will allow for increased flexibility with respect to developing material movement plans.

To further reduce the potential for the release of net acid and elevated metal loads, the following ML/ARD mitigation strategies should be considered.

Handling of Misclassified PAG Rock within NPAG WRSA

Although all efforts will be made to effectively segregate PAG and NPAG waste rock, the misclassification of a portion of the mined blast rock through unrepresentative subsampling cannot be ruled out in all cases. These cases would likely come to light during verification monitoring (see Section 4.1.3). In a sensitivity analysis, the site-wide water quality model has considered the possibility of PAG rock misplacement in the NPAG WRSA for up to 2% of the NPAG WRSA. Under the current mine plan, this accounts for approximately 8% of all PAG material being misclassified, which is conservative. Besides assessing the effect of the PAG rock being deposited in the NPAG WRSA on water quality, source control measures can be implemented to minimize the impact of PAG rock on NPAG WRSA seepage quality. Such measures include:

a. Blending of PAG and NPAG materials;
b. Encapsulation of PAG rock; and
c. Re-location of PAG rock

The objective of blending PAG and NPAG materials is to obtain an NPAG composite. The method concept is based on the principle that excess NP in the NPAG material will neutralize the acid produced by the PAG material. A good understanding of the variability in NP and AP for both PAG and NPAG material is required in order to determine the proportions of PAG and NPAG material that will consistently produce an NPAG composite. Generally, since complete mixing of PAG and NPAG rock may not be easily achievable in coarse waste rock materials and zones with higher PAG material concentrations can be expected, the blended layers pile should have a target bulk NPR of ≥ 3.

Encapsulation is a specific type of blending option that requires PAG material to be entirely enclosed by NPAG material. This decreases the exposure of the PAG material to both water and oxygen and provides alkalinity before and after water comes in contact with the PAG zone. In order to be effective, any acidic seepage generated by the PAG material must be neutralized by the encapsulating NPAG material.

Relocation of material to the PAG WRSA may be required if verification monitoring suggests that the volumes of misplaced PAG materials are higher than expected and if in-situ mitigation strategies prove to be insufficient. The re-handling of these materials will be required to avoid effects of localized ARD development in the NPAG WRSA and associated effects on the aqueous environment.

Placement of Synthetic or Natural Cover on PAG WRSA

Covers over PAG material limit ML/ARD by reducing the exposure of the PAG material to water and oxygen. These can include geosynthetic covers or geomembranes as well as natural covers made of low hydraulic conductivity material such as till or clay or store and release covers. The covers must be carefully constructed in order to meet the design objectives and may require regular inspection for potential damage. Decisions around cover design may be made as more information around PAG balance and reactivity becomes available via operational ML/ARD monitoring.

The benefits of cover placement are twofold. First, the cover will shed precipitation and thereby reduce the infiltration rate and net percolation within the WRSA. The resulting lower seepage rates will result in a reduction of the overall geochemical load being released from the WRSA which facilitates water management or treatment, if necessary. Second, both synthetic and natural covers may be designed to act as an oxygen barrier that slows the diffusion of oxygen into the waste pile. Once pore water oxygen is depleted by sulphide oxidation, the slow replenishment of oxygen through the cover will result in a lower proportion of the WRSA being exposed to oxygen. As such, the risk for ARD developing throughout the pile is reduced.

4.1.2.2 Ore

Material classified as ore will either be processed directly or transported to the low-grade ore stockpile for temporary storage. Based on the current knowledge of FMS ore, these materials contain sufficient NP to buffer acidity at circum-neutral pH levels for the duration of the operating mine life until re-handling and processing is initiated prior to closure. Therefore, no special handling considerations are currently proposed. Should continued operational monitoring indicate contiguous areas of low-NP PAG material, a geochemical investigation into the lag time to onset of ARD and potential mitigation measures will be triggered. In addition, if unforeseen circumstances render the low-grade ore stockpile uneconomic, effectively rendering it a permanent waste rock facility, then ARD mitigation measures will need to be re-evaluated and implemented as necessary. To pro-actively manage for such a scenario, the placement of the ore stockpile in proximity to the PAG WRSA may be beneficial for water management purposes and for the implementation of post-closure strategies such as cover placement.

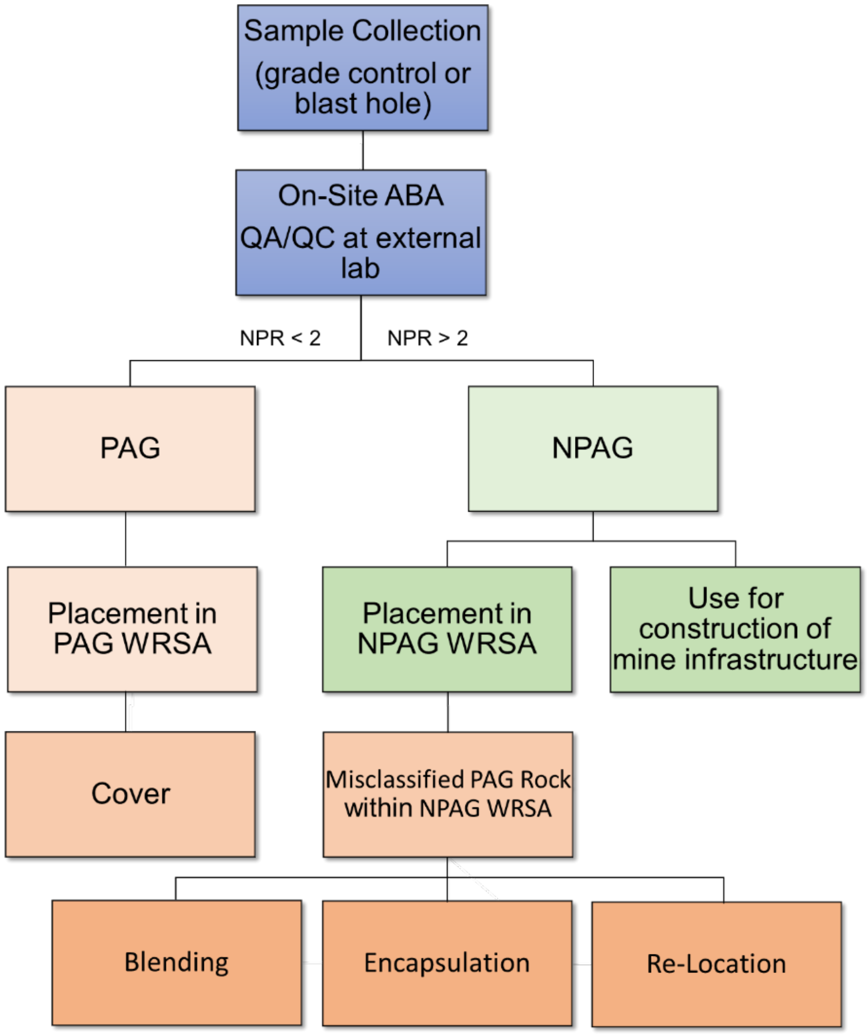

Figure 4-2: In-Pit Material Handling Decision Tree

4.1.3 Verification Monitoring

Confirmatory sampling of placed waste rock and ore should be conducted in the WRSAs and in areas where waste rock is used for construction. This sampling program will comprise surface sampling along freshly placed material and will ensure that proper material handling protocols have been implemented and that placement of PAG material has been properly managed. A sampling frequency of one sample per every 400,000 tonnes of material placed is recommended. These samples should be submitted for ABA and aqua-regia digestible metals.

In addition to mine rock sampling, regular surface water monitoring of the waste rock collection ponds as well opportunistic sampling of surface seeps is recommended as part of the verification monitoring for the site. Any ML/ARD influence on the pond water quality would be indicated by a decrease in pH and/or an increase in sulphate and metal concentrations. Such water monitoring will allow for the early detection of waste rock zones that have turned acidic and may trigger adaptive management.

4.2 Tailings

4.2.1 Monitoring

The recommended monitoring frequency for tailings samples is one sample for every 100,000 tonnes of ore processed. Tailings slurry samples will be collected from the tailings screen at the mill. The slurry is then filtered, and the tailings solids are submitted to the lab for analysis. These samples should be analyzed for ABA at a minimum. Analysis for aqua-regia digestible metals is also recommended. Note that kinetic testing in the form of saturated columns is currently being operated at the Lorax laboratory in order to quantify metal leaching rates under suboxic conditions. These experiments were used as the basis for source term and water quality model predictions.

4.2.2 Material Handling and Management

The tailings slurry will be deposited in the TMF and a water cover will be maintained over the bulk of the tailings volume during operations, with tailings beaches being intermittently exposed to the atmosphere. In post-closure, the TMF will be drained and the majority of the tailings in the upper TMF zones will be subject to oxidative weathering. During operations, the ML/ARD risk from the FMS tailings is expected to be limited due to predominantly water-saturated storage within the TMF. Further, the geochemical assessment of tailings produced by metallurgical testing showed that materials produced by conventional ore processing, which is the designated method for FMS ore, have NPAG character (Lorax, 2019b). As opposed to blast rock, the acid-producing and acid-consuming phases in the tailings slurry will be well mixed which generally bears a lower risk of localized ARD. In combination, the presently available information suggests that the risk for ARD from exposed tailings is low, even under oxidizing conditions.

Operational experience at Touquoy will be used to develop management strategies for the FMS tailings, if needed. Nevertheless, should operational monitoring unexpectedly show larger quantities of PAG tailings being deposited in the TMF, the following mitigation strategies similar to those already discussed in Section 4.1.2.1 should be considered:

- Covering of PAG with NPAG tailings in the long-term; and
- Synthetic or natural dry covers on TMF.

In addition, potential mitigation options specific to tailings that may be implemented, if required, are:

- Increased addition of lime; and
- Subaqueous storage.

Increased Addition of Lime

Increasing the amount of lime added to the tailings will increase the neutralization potential of the tailings stream. The volume of lime added must be sufficient to neutralize the acid generating potential of the tailings to increase the NPR > 2.

Subaqueous Storage

Storage of PAG material under water cover reduces sulphide mineral oxidation by decreasing the availability of dissolved oxygen; however, there may be impacts to water quality through pH and/or redox-dependent processes. In order to maintain a continual water cover over the PAG material, consideration must be given to the design of the storage facility's water balance and long-term geotechnical stability. If monitoring suggests that the tailings stream has PAG character for extended periods of time, preferential deposition in the saturated zones of the TMF should be considered.

5. Implementation and Reporting

5.1 Record Keeping and Tracking

The Environmental Superintendent or designate is responsible for the implementation of the Mine Rock Management Plan with support from Mine Engineering, Geology, and Mill Metallurgy. The laboratory chain of custody (COC) and raw data files from the laboratory should be kept on file. Field notes and both on-site and external laboratory test results should be compiled into an electronic database. The Environmental Superintendent or designate will be responsible for the maintenance of the original records and database. Records of ML/ARD assessment testwork and weekly pH measurements for drainage water quality must be available on site for inspection by NSE.

Tracking of lithologies (argillite- versus greywacke-dominated) for the individual blasts is recommended where possible due to the known different geochemical behaviour of the two rock type end-members. A record of the volume, material type, and material placement should be maintained by Mine Operations & Engineering and updated on a regular basis. A copy of the record should be provided to Atlantic Gold's environmental department on a monthly basis. Investigation and corrective action will be undertaken if monitoring data indicates that actual geochemical characteristics are significantly different than expected based on the geochemical characterization testwork conducted to date.

5.1.1 Monitoring Reporting

A summary of the ML/ARD results and material placement should be provided in the Annual Report. An analysis of the new sampling results should be included and any notable deviations from previous years should be discussed.

5.1.2 Incident Reporting

If test results indicate that currently acid-generating (AG) rock, identified by means of rinse pH measurements, is encountered, NSE will be notified. The location and volume of AG material should be estimated and recorded. At a minimum, an AG sample would trigger confirmatory analysis. Additional monitoring, mitigation, and/or relocation to the PAG WRSA may be required.

6. Closure

This report was prepared by Lorax Environmental Services Ltd. for the exclusive use of Atlantic Mining Nova Scotia Inc. This initial plan has been developed to outline ML/ARD monitoring measures and management options that can be considered for the Fifteen Mile Stream project. Please contact the undersigned should you have any questions or comments or require additional information in support of this work.

Sincerely,
LORAX ENVIRONMENTAL SERVICES LTD.

Prepared by:

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Reviewed by:

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Senior Environmental Geoscientist.

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