
# Appendix A.4b

NSSA letter March 21, 2021,
Notes from Sept 9, 2020 meeting and presentation as
Completed for the Updated 2021 Beaver Dam Mine EIS

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March 2, 2021

Dr. Eddie Halfyard
Nova Scotia Salmon Association
107 Farmers Dairy Lane,
B4B 2C9

**RE: Request for Clarification on NSSA's Current and Future Programs**

Dear Dr. Halfyard,

Atlantic Mining NS Inc. (AMNS) is writing to seek clarification on Nova Scotia Salmon's Association's (NSSA) current and future programs. The information is required to address potential interactions between the proposed Beaver Dam Mine Project and the NSSA's Projects as part of the Cumulative Effects Assessment (CEA) (CEAA 2018).

It is our understanding that the NSSA' physical activities', or Projects, include the following three main Projects:

1. the West River Lime Dosing station Project;
2. the Killag River Dosing station Project; and
3. the terrestrial or catchment liming Project.

Based on publicly available information, we assume that the lime dosing stations have been in operation since 2005 and 2017, respectively. The intent is that these Projects will remain in place for the foreseeable future to treat acidified waters within the West River Sheet Harbour watershed.

The spatial and temporal overlap among these Projects and the proposed Beaver Dam Mine Project will allow AMNS and regulators to understand potential cumulative environmental effects better. A review of scientific literature and communications from both the NSSA and DFO enabled us to identify the areas, timelines for completion, and upcoming terrestrial liming work.

Our goal of this communication is to summarize our understanding of the terrestrial liming Project and confirm whether our understanding of terrestrial liming's spatial and temporal extent is correct. Through our review, we have identified the following watersheds as locations for completed or proposed terrestrial liming application:

**Keef Brook Watershed (NSSA, 2017; Rotteveel, 2018)**
According to Rotteveel (2018), terrestrial liming occurred in MacGregor Brook and Colwell Brook during the fall of 2016, with some expected blowouts from helicopter liming affecting Cope Brook. The upper portion of the Killag River (above the lime dosing station) and Brandon lake Brook are control sites for this study. This study's methods and results are in Ms. Rotteveel's honours thesis (Rotteveel, 2018). It is our understanding that additional terrestrial liming will occur at this location in the foreseeable future. Please confirm if there are plans for future terrestrial liming in this watershed.

**Paul Brook and Tent Brook Watersheds (DFO, 2020)**
On September 25, 2019, AMNS met with the NSSA and ASF to discuss the second round of information requests related to the proposed Beaver Dam Mine Project. During that meeting, the NSSA stated that a terrestrial lime application would occur in the Tent Lake watershed; but indicated that terrestrial liming would occur in proximity to the proposed organics stockpile in 2020.

**Overview of Fish and Fish Habitat in West River Sheet Harbour**
On July 21, 2020, DFO provided a presentation entitled "Overview of Fish and Fish Habitat in West River Sheet Harbour" to AMNS and the Impact Assessment Agency of Canada. Within this presentation, a map was provided with '2018-2022 Helicopter Liming' in a summary of restoration work ongoing within the watershed – this Helicopter Liming polygon outlined both Tent Brook and Paul Brook. We assume that the methods as outlined by Rotteveel (2018) within the Keef Brook watershed will be followed in a general manner in both watersheds. Please confirm if the NSSA intends to follow the methods outlined in Rotteveel (2018) for terrestrial liming projects.

The spatial and temporal scale of terrestrial liming in the Paul Brook watershed is unknown. The spatial extent of terrestrial liming through the Tent Lake watershed is unknown. NSSA indicated that annual lime application would continue for five years. Please confirm the spatial scope of the Paul and Tent Brook terrestrial liming project(s). Please confirm the temporal range of Paul Brook (unknown) and Tent Brook (2019-2023 - five years).

**Summary**
To evaluate potential cumulative effects, we plan to consider terrestrial liming within Tent Brook and Paul Brook watersheds as present and future projects.

Our assumptions for the cumulative effects assessment include the following:

- *No additional terrestrial liming is planned for Keef Brook.*
- *All terrestrial liming will follow methodologies outlined in Rotteveel (2018)*
- *Paul Brook terrestrial liming is ongoing. We will move forward considering that this Project is a historical, current and future initiative across the entire watershed (spatial extent) spanning from 2018 to 2022.*
- *Tent Brook terrestrial liming is ongoing. We will move forward considering that this Project is a historical, current, and future Project across the entire watershed (including the organics stockpile location) as the spatial extent, spanning from 2019 to 2023.*
- *No other terrestrial liming projects are proposed within the West River Sheet Harbour secondary watershed.*

Please confirm if these assumptions regarding spatial and temporal extents, methods, and preliminary or published monitoring results of NSSA terrestrial liming programs are accurate.

Additionally, please share information relating to your confirmed projects, in line with CEAA guidance document (CEAA, 2018). For reference, the CEAA guidance document outlines information about each Project that should be included in the cumulative effects assessment (CEAA, 2018, p.28):

- location, physical size (e.g., area covered, the volume of process throughput), and spatial distribution of components (i.e., site-specific, randomly dispersed, travel corridors);
- components (e.g., main plant, access roads, waste disposal site) and supporting infrastructure (e.g., waste treatment, power lines);
- expected life or period of activity (including start date), and phasing involved (e.g., exploration, construction, standard operations, later plans for upgraded or expanded operations, decommissioning, and abandonment);
- variations in seasonal operation (e.g., winter closures);
- frequency of use (for intermittent activities – e.g., helicopter use);
- transportation routes and mode of transport (e.g., roads, railways, shipping lanes);

- processes used (for industrial activity – e.g., open pit mining);
- emissions, discharges, and wastes that are likely to be released, and where;
- approvals received (e.g., permit and license conditions in effect); and
- duration of any in-place or planned follow-up program.

Thank you for taking the time to review this letter and we would appreciate information you are willing to share. We understand that the NSSA does not wish to engage with AMNS about the proposed Beaver Dam Mine Project at this time. We, however, want to ensure that information included in the Environmental Assessment is accurate and would like to provide you with the opportunity to correct assumptions and expand on information to ensure regulators have the information necessary to make informed decisions. AMNS supports the work being undertaken by the NSSA and it is our sincere hope that we will be able share and exchange data in an environment of cooperation and for the betterment of neighbouring watersheds.

Should you have questions or concerns, please contact me directly at 902-499-7910 or Veronica Chisholm at 587-999-1575.

Sincerely,

<Original signed by>

James Millard, Manager Environment and Community

cc: Veronica Chisholm (AMNS); Meghan Milloy (McCallum Environmental Ltd.)

# DRAFT

# Summary Notes

**RE:** Nova Scotia Salmon Association (NSSA) – Proposed Beaver Dam Mine Draft EEM and Fisheries Authorization Discussion (TEAMS CALL)

**Date:** Tuesday, September 9, 2020

## 1. Agenda

1. Introductions/Attendees
2. Project Update - Current infrastructure update for the proposed Beaver Dam Mine Site
3. Introduction to Environmental Effects Monitoring (EEM) under the Metal and Diamond Mining Effluent Regulations (MDMER)
4. Discussions for input on the EEM
5. Fisheries Authorization and offset for the proposed Beaver Dam Mine Site
6. Other Items/Closing Remarks

Attachments: Proposed Beaver Dam Mine EEM and Fisheries Presentation (September 9, 2020)

1. Introductions/Attendees

| Name | Affiliation | Email |
|---|---|---|
| ***Attendees*** | | |
| Edmund Halfyard | NSSA | EAHalfyard@hotmail.com |
| Bob Rutherford | NSSA | bobrutherford@adoptastream.ca |
| Amy Weston | NSSA | amy.weston@nssalmon.ca; |
| Jillian Leonard | NSSA | jillian.leonard@nssalmon.ca |
| Mike Crosby | NSSA | mikercrosby@gmail.com |
| James Millard | AMNS | james.millary@atlanticgold.ca |
| Veronica Chisholm | AMNS | veronica.chisholm@atlanticgold.ca |
| Meghan Milloy | MEL | meghan@mccallumenvironmental.com |
| Mary Murdoch | Stantec | Mary.Murdoch@stantec.com |
| Jenny Reid | Stantec | Jenny.Reid@stantec.com |
| James McCarthy | Wood plc | james.mccarthy@woodplc.co |
| ***Regrets*** | | |
| Amber Stoffer | MEL | Amber@mccallumenvironmental.com |
| Anne Somers | Stantec | Anne.Somers@stantec.com |

NSSA= Nova Scotia Salmon Association; AMNS=Atlantic Mining Nova Scotia Ltd.; MEL=McCallum Environmental

2. **Project Update**
   - Jim provided an overview of the proposed Beaver Dam Mine Project. Including updates to the location of mine rock piles, PAG pile, and organic stockpiles.
   - NSSA Concerns raised in the previous meeting regarding the organic stockpiles and effluent from those stockpiles.

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| • Action 1. AMNS agrees to assess the possible use of lime to treat effluent from stockpiles before release. |

   - NSSA concerns raised regarding drawdown resulting from pit construction, loss of catchment area (surface losses), loss during and until pit refilled (i.e., fractures and fissures). Expressed interest in plans associated with pit refilling and impacts as well as the overall impact on water quality/inflows into Killag River during construction, operations and closure.

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| • Action 2. AMNS/MEL – responded by stating that AMNS will present an updated water balance that will review changes to water inflows during construction, operations and closure. |

   - NSSA asked about the timing of the effluent release.
   - AMNS discussed some limitations with the settlement ponds capacity that would impact the timing for release.
   - NSSA raised the topic of looking for opportunities to enhance fish habitat in the pit for example littoral zone around the pit for spawning habitat as well as how best to ensure long-term water quality goals.

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| • Action 3. AMNS to discuss water quality (during all phases) and fish habitat (e.g., littoral zones) at Closure |

3. **Introduction to Environmental Effects Monitoring (EEM) under the Metal and Diamond Mining Effluent Regulations (MDMER**)
   - Mary Murdoch and Jenny Reid (Stantec) presented information on EEM requirements.
   - Discussed benefits of completing baseline EEM before Phase 1 EEM
   - Provided an overview of the study design, how the data is collected and how we are envisioning the program moving forward with information collected to date.
   - Questions regarding the selection of sentinel species, namely Atlantic Salmon and Brook Trout. There was a discussion on other species that were selected for the baseline EEM (yellow perch and white sucker) based on their abundance in the area.
   - Concerns regarding capturing species at risk (i.e., American eel) and salmonids (Atlantic salmon and brook trout), due to low abundance/populations in the area

- Discussion by NSSA and Stantec regarding the movements of salmonids in the receiving environment and their potential exposure to the effluent, particularly during the summer months when accessing thermal refugia.

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| • Action 4. NSSA indicated they have data on the presence and timing of fish movements in the area and physical habitat and may be willing to share these data. |

4. **Discussions for input on the EEM**
   - NSSA asked how far from within the exposure area baseline sampling was undertaken?
   - Stantec responded by stating approximately 500 m from the site.

- NSSA asked if there would be an opportunity to extend the baseline sampling further downstream into the Killag into a more riverine environment but still within the exposure area?

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| • Action 5. AMNS stated possible to extend the sampling program next year and will assess the possibilities and continue the conversation on this. |

- NSSA asked about the possibility of accessing and sampling water quality north in the Tent Lake area?

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| • Action 6. AMNS/MEL agreed to investigate access into the Tent Lake area for additional water sampling as part of the surface water sampling program, MEL to complete and report back. |

- Question: How many fish are required for tissue sampling?
- Response: 100 YOY (young of the year) and 100 non-YOY are required for a non-lethal EEM survey.
- Stantec indicated that they wanted to avoid salmonids for the EEM.
- NSSA indicated brook trout are consumed by anglers and we should consider tissue collection from salmonids.
- Stantec indicated they had collected tissue samples from white suckers and yellow perch and they may be able to be used as a surrogate for salmonids however some additional research would be required to better understand metal accumulation in those species.
- Stantec – they sample 5-10 fish from similar age groups for tissue.
- However, sampling is dependent on objectives if we want to understand variations across age groups.
- NSSA stated that they have been sampling salmonid gills to assess the effects of metal loading during smoltification. It is complicated because it requires an understanding of Ca, Mg, and Na present in the water that would impact absorption.

- NSSA stated that they use 3-4 gill filaments that have been used to measure metals and those samples are sent to partnership labs such as the University of Windsor and the US - NOAA (Woods Hole Oceanographic Institute).
- NSSA also mentioned the work they have been doing using Acoustic telemetry with samples being assessed in Truro.
- Stantec mentioned that one of the requirements of EEM is that samples are required to be analyzed at an accredited lab that does place limitations on the sampling program.
- NSSA showed a figure of mercury and arsenic accumulation in yellow perch relative to the Canadian Guidelines for Fish Consumption that shows elevated (high) levels.
- Stantec asked if they could get access to that study and NSSA noted that it was undertaken for the NS government in the vicinity of historic tailings. The best persons to contact regarding getting a copy of the study is Al MacNeil (Director, NS Inland Fisheries) or Jason LeBlanc (Manager, NS Inland Fisheries).
- Stantec noted concerns sampling low populations of fish with could pose a larger impact to fish populations than the effect of discharge they are measuring.
- Need to evaluate surrogates to address the above concerns around metals in fish tissue as discussed.
- It was mentioned that in addition to fisheries sampling there is a large-scale water quality sampling effort and that hydrometric stations will be installed during operations to measure water levels.

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| • Action 7 Stantec agrees to undertake the following: |

- Request fish tissue in metals report/data for Nova Scotia from Al MacNeil or Jason LeBlanc; review report to determine relationships amongst species (i.e., do we see similar patterns in white sucker, yellow perch as we see in salmonids);
- Review the information on brook trout provided by NSSA (abundance, distribution, seasonal presence) along with the baseline fish results to evaluate the suitability for use of brook trout as a sentinel fish species for EEM; and
- Review physical habitat data provided by NSSA to evaluate the benefit of sampling riverine locations for benthic invertebrates to potentially supplement the baseline EEM information.

- Action 8 NSSA agrees to provide the following data:
  - Juvenile salmonid electrofishing data including non-target species, physical habitat and water quality data from the past 10 years (more if available) for the Killag and adjacent sub-watersheds, as available;
  - Results of any predictive modelling or data that was conducted identifying the location of cool water seeps within 5 km upstream and downstream of the Project on the Killag River;
  - Technical reports that NSSA has completed on metal binding to gills for salmonids; and
  - Any information on tracking movement of fish in the watershed (e.g., smolt wheels).

5. **Fisheries Act and Offset for the Proposed Beaver Dam Project**
   - Wood plc introduced Fisheries Authorization and slides include details on habitat sampling effort.
   - Indicated that we are looking for projects to fulfill off-setting requirements and believe there are likely synergies with NSSA
   - NSSA indicated that they would be interested in continuing discussion on this.

Action 9. AMNS includes offsetting projects on the next meeting's agenda and NSSA will provide input.

7. **Closing Remarks**

   - NSSA requested a copy of the presentation.

Action 10. AMNS agreed to email the presentation and noted that the site layout map, sent earlier, is still a working draft.

- The next meeting will target the week of October 19, 2020.

Action 11. NSSA indicated that they would meet and send an email indicating their meeting date/time preference.

**Action Log**

| # | Responsibility | Action |
|---|---|---|
| 1 | AMNS | AMNS agrees to assess the possible use of lime to treat effluent from stockpiles before release and report back to the group |
| 2 | AMNS/MEL | AMNS will present an updated water balance that will review changes to water inflows during construction, operations and closure |
| 3 | AMNS | AMNS to discuss water quality (during all phases) and fish habitat (e.g., littoral zones) at Closure |
| 4 | Stantec/NSSA | NSSA indicated they have data on the presence and timing of fish movements in the area and physical habitat. |
| 5 | AMNS | AMNS stated it is possible to extend the sampling program next year and will assess what that requires and continue the conversation on this. |
| 6 | AMNS/MEL | Agreed to investigate access into the Tent Lake area for additional sampling and report back. |
| 7 | Stantec | Stantec agrees to undertake the following:<br>• Request fish tissue in metals report/data for Nova Scotia from Al MacNeil or Jason LeBlanc; review report to determine relationships amongst species (i.e., do we see similar patterns in white sucker, yellow perch as we see in salmonids);<br>• Review the information on brook trout provided by NSSA (abundance, distribution, seasonal presence) along with the baseline fish results to evaluate the suitability for use of brook trout as a sentinel fish species for EEM; and<br>• Review physical habitat data provided by NSSA to evaluate the benefit of sampling riverine locations for benthic invertebrates to potentially supplement the baseline EEM information. |
| 8 | NSSA | NSSA agrees to provide the following: |

| # | Responsibility | Action |
|---|---|---|
| | | • Juvenile salmonid electrofishing data including non-target species, physical habitat and water quality data from the past 10 years (more if available) for the Killag and adjacent sub-watersheds, as available;<br>• Results of any predictive modelling or data that was conducted identifying the location of cool water seeps within 5 km upstream and downstream of the Project on the Killag River;<br>• Technical reports that NSSA has completed on metal binding to gills for salmonids; and<br>• Any information on tracking movement of fish in the watershed (e.g., smolt wheels). |
| 9 | AMNS | AMNS includes offsetting projects on the next meeting's agenda and NSSA will provide input. |
| 10 | AMNS | AMNS agreed to email the presentation and noted that the site layout map, sent earlier, is still a working draft. |
| 11 | NSSA | NSSA indicated that they would meet and send an email indicating their meeting date/time preference. |

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# Project Update

# Agenda

- Introductions.
- Current infrastructure update for the proposed Beaver Dam Mine Site. Questions.
- Introduction to Environmental Effects Monitoring (EEM) under the Metal and Diamond Mining Effluent Regulations (MDMER).
- 2020 EEM baseline data collection program at Beaver Dam
- Discussion and input on the EEM.
- Fisheries Authorization and Offsets for Beaver Dam
- Other items and closing

# Infrastructure Update

# Beaver Dam Infrastructure Update

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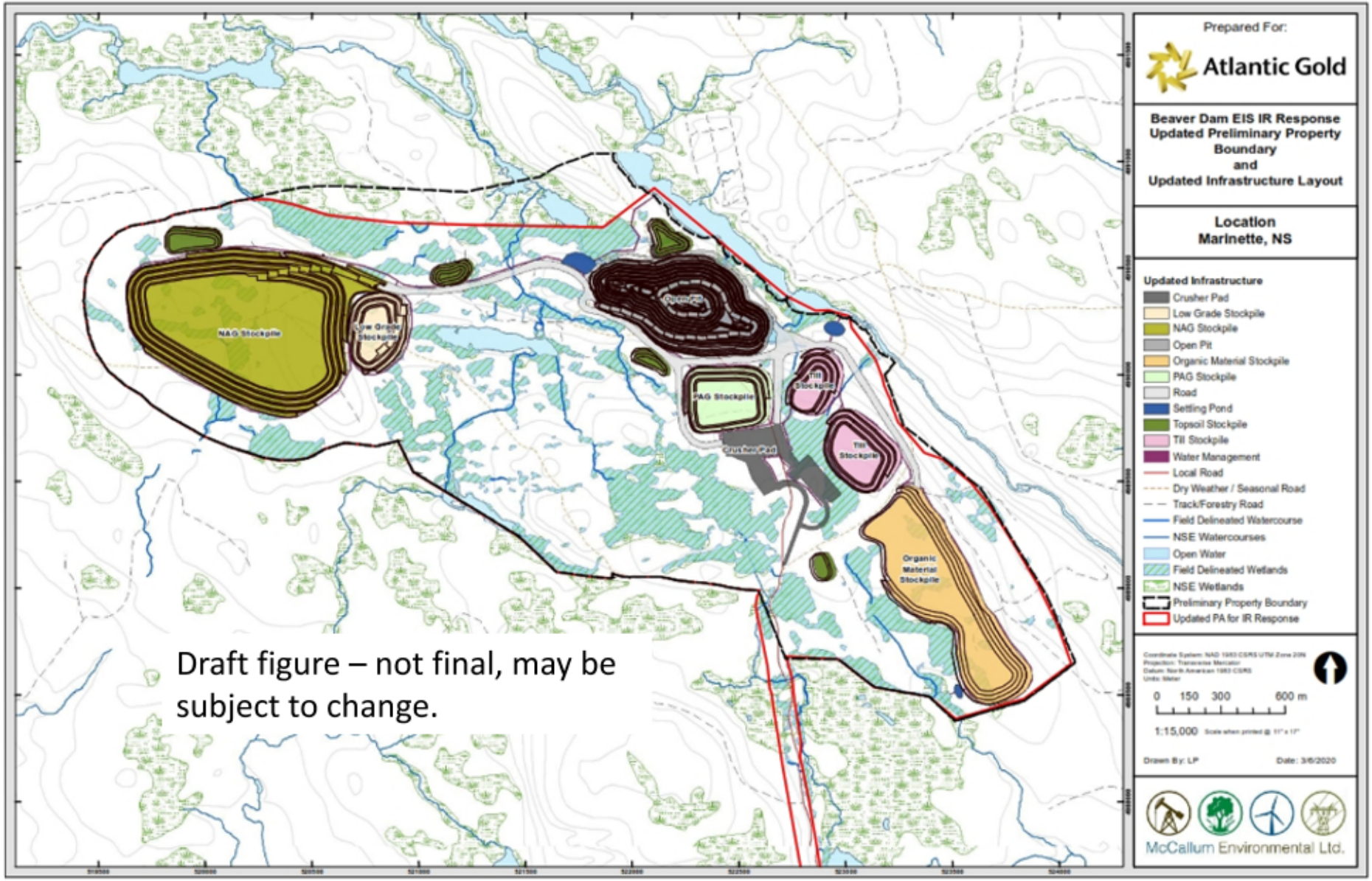

# Site Infrastructure Update

- Draft location plan, still subject to minor changes from FS and further refinement.
- Key item is location of the Organic Material Stockpile
- Reviewed other options, but the site is very constrained due to BFL, waters frequented by fish, wetlands, available footprint considerations, etc.
- We were unable to identify an alternative acceptable location given the above constraints.
- Impact to this location would be for approximately five years.
- At the end of mining, the material contained in this stockpile would be utilized for reclamation across the site and the stockpile footprint itself, as well as other disturbed areas across the site, would be revegetated and restored to a natural condition.
- During construction and operations, the surface drainage of the area would be managed and controlled to prevent offsite impact to nearby water bodies.

# Environmental Effects Monitoring Overview

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# > Baseline EEM Introduction

- > Several Monitoring Programs for Water and Fish and Fish Habitat
  - Environmental Assessment – Follow-up Monitoring to confirm EA predictions
  - Fisheries Act Authorization – Follow-up Monitoring
  - Other permits and approvals (Industrial Approval, Water Withdrawal)
  - Metal and Diamond Mining Effluent Regulations
    - > Effluent quality including sublethal toxicity testing
    - > Water quality monitoring
    - > **Environmental Effects Monitoring (biological studies)**

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# > Regulatory Requirements

- Required under MDMER pursuant to the *Fisheries Act* when mines begin discharging >50 $m^3$/day of effluent
- EEM addresses potential effects of mine effluent to fish and fish habitat
- Baseline EEM is a <u>proactive step</u>
  - > Not required under MDMER
  - > Establishes the pre-construction / mining conditions in the receiving environment
  - > Provides information to design an effective EEM program
  - > 2020 Baseline Program – August/September

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# > EEM Study Components

Biological studies:

- fish population study
- fish tissue study
- benthic invertebrate community survey
- supporting environmental variables

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# > Baseline EEM Program

Purpose:

- Provide information to NSSA
  - > Overview of environmental effects monitoring (EEM)
  - > Details of 2020 baseline EEM program
  - > Results to date
- Seek input from NSSA
  - > Fish species and catch methods in Killag River
  - > Presence of Atlantic salmon upriver of the liming station

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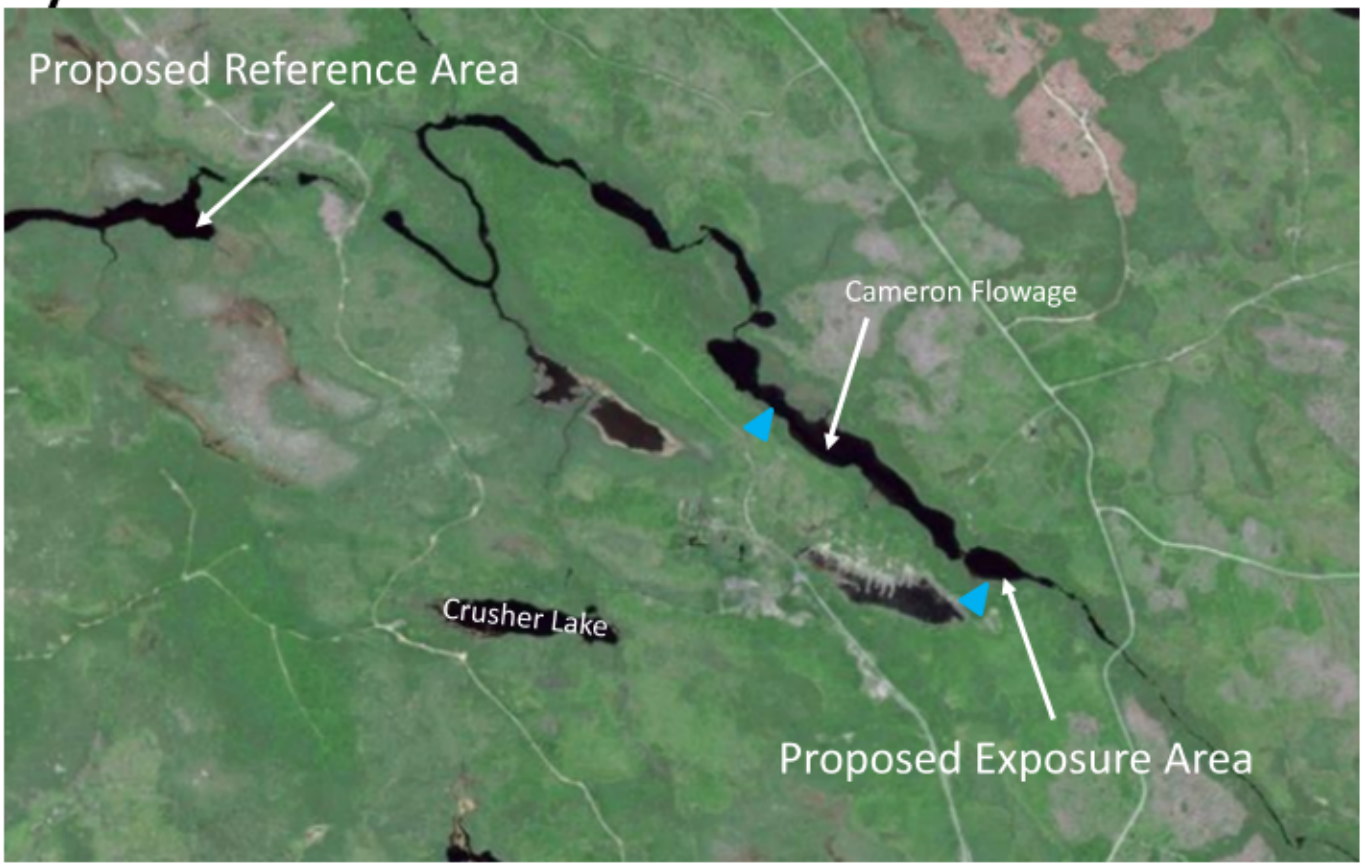
# > Study Area




Proposed Treated Effluent Discharge Locations

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# Baseline EEM Program Overview

- Two sentinel species; forage fish and angled fish (avoiding Atlantic salmon and brook trout)
- Non-lethal capture methods: fyke nets, minnow traps
- EEM effect indicators
  - Growth: size at age (body wt)
  - Reproduction: relative gonad size (body wt)
  - Condition: body wt to length, relative liver size (liver wt to body wt)
  - Survival: age

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# > Baseline EEM Program Overview

- > Determine baseline metal concentrations in fish tissue
- > Focus on sentinel fish species
  - > Forage species: whole body
  - > Angled species: whole body and muscle (human consumption)
- > Analyze for metals, lipids, % moisture

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# Baseline EEM Program Overview

- Method:
  - petit ponar
  - mid-depth
- EEM effect indicators:
  - Density
  - Simpson's Evenness Index
  - Taxa Richness
  - Similarity Index (Bray-Curtis)

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# > Baseline EEM Program Overview

- Habitat survey to document aquatic habitat conditions
- Water quality samples:
  - > in situ parameters
  - > general chemistry
  - > total and dissolved metals
  - > total mercury
  - > cyanide
  - > chlorophyll a
- Sediment quality samples:
  - > trace metals
  - > grain size distribution
  - > total organic carbon content

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## EEM Discussion

- Questions on EEM or Baseline EEM Program?
- Fish species and catch methods in Killag River
- Presence of Atlantic salmon upriver of the NSSA liming station

# Fisheries Act Authorization and Offsetting

# Fisheries Authorization: Fish Habitat Restoration/Creation

- *Fisheries Act* Section 35(1): *No person shall carry on any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat*
  - *Unless Authorized (Section 35(2b))*

> Conceptual Fish Habitat Offsetting Plan:

1. Identify the potential residual effects of the Project that may result in HADD of fish habitat.
2. Describe the fish species being affected by the proposed Project activities.
3. Describe the proposed concepts to offset the loss of fish productive capacity.

- Provides information necessary to determine if measures to offset unavoidable HADD of fish habitat can be achieved.

# Fisheries Authorization: Fish Habitat Restoration/Creation

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**Step One:** Avoidance of HADD

Based on:

- Project Design/Layout
- Water Management

# Fisheries Authorization: Fish Habitat Restoration/Creation

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**Step Two:** Habitat Quantification

Based on:

- DFO Comments / Concerns
- Processes used in other portions of Atlantic Canada
- Will Use Existing DFO Databases and Methods:
  - Objective
  - Defensible

# Fisheries Authorization: Fish Habitat Restoration/Creation

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**Step Three:** Offset Concept Development

Potential options are being evaluated by consideration of multiple criteria including:

- Adherence to DFO's principles for offsetting;
- Location within the watershed and close to the Project site;
- Self-sustaining;
- Technically feasible and economically viable; and
- Provide similar "in-kind" habitat as an offset

Utilized a ranking system to assess the preferred offsetting alternatives.

# Fisheries Authorization: Fish Habitat Restoration/Creation

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**Potential options:**

- Develop New Habitat on Site
- Complimentary Measures (local Indigenous community involvement)
- Develop New Habitat off Site
- Restoration of Degraded Habitat in Former Mining Areas
- Restoration of Degraded Habitat in Other Watersheds Outside the Project Area

# Fisheries Authorization: Fish Habitat Restoration/Creation

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- Complete Site Data Collection for Direct and Indirect Calculations
- Completion of Habitat Quantification (HEUs and Points of Inflection)
- Submission of draft Offset Strategy (DFO, Indigenous Groups, Stakeholders)