# SD 07

## Wetland Protection Plan

**Wetland Protection Plan – Proposed Plan Updates (July 2021)**

| Report Section | Update | Rationale |
|---|---|---|
| Introduction | Update proponent/regulatory information and list of submitted reports and assessments. | Proponent/regulatory name changes. Add reports and updated findings submitted since 2016 (e.g., wetland compensation plan, most recent wetland/watercourse alteration applications or amendments).<br>Update WPP timeline with respect to new mine developments (previously 2016-2019). |
| 2.0 Associated Documentation | N/A | No need for updates due to proposed modifications to the Approved Project. |
| 2.1 Environmental Protection Plan | Reference current EPP. | EPP referenced as 'to be completed'. Review latest revision of the EPP and update section as needed. |
| 2.2 Wetland Monitoring Plan | Reference current WMP. | WMP referenced as 'to be completed'. The WMP was developed and implemented in 2016. Wetland alteration numbers and areas will need to be updated since 2016. Review annual monitoring reports for updates. |
| 2.3 Water Management Overview | Reference current reports/approvals.<br>Overview updated water management strategy since initial WPP | Align with current water management proposal at site. |
| 3.0 Wetland Impact Types | No update. Broad overview of potential impact types only. | No change to impact types (i.e., hydrology, water quality, malfunctions/accidents and vegetation/habitat integrity). |
| 4.0 Protection of Permitted Wetlands | N/A | No need for updates due to proposed modifications to the Approved Project. |
| 4.1 Construction Related Protection Methods | Review construction mitigations. | Wetland monitoring results to be reviewed and construction related issues identified (if applicable). Discuss updated mitigations as necessary that were not in original WPP. |
| 4.2 Hydrological Related Protection Methods | Update with current WMP and other reports. | Wetland monitoring results to be reviewed and hydrological related issues identified (if applicable). Discuss updated mitigations as necessary that were not in original WPP. |
| 5.0 Off-Site Wetland Protection | N/A | No need for updates due to proposed modifications to the Approved Project. |
| 5.1 Downstream and Upstream Wetlands | Review off-site wetland impacts. | Review current wetland impacts and connectivity to off-site wetlands. Update as necessary. |
| 5.2 Partially Altered Wetlands | Update wetland alteration areas. | Update with changes to wetland alteration areas and current WMP. |
| 6.0 Recommendations | Update likely required. | Update if changes in impact/monitoring/mitigation identified. |
| 7.0 Closure | Update as necessary. | |

**Wetland Protection Plan – Proposed Plan Updates (July 2021)**

| Report Section | Update | Rationale |
|---|---|---|
| Appendix A – Figures | Updates to wetland delineation areas and impacts. | Add additional wetlands which have been delineated since 2016 and changes to impact areas. Update mine site footprint. |

# WETLAND PROTECTION PLAN

# TOUQUOY MINE GOLD PROJECT
# MOOSE RIVER, NOVA SCOTIA

**Prepared for:**

**Atlantic Gold Corporation**
**6749 Moose River Rd,**
**RR#2, Middle Musquodoboit, NS,**
**B3B 1J7**

**Prepared by:**

**McCallum Environmental Ltd.**
**2 Bluewater Road, Suite 135**
**Bedford, Nova Scotia**
**B4B 1G7**

**April 12, 2016**

## EXECUTIVE SUMMARY

Atlantic Gold Corporation (the Proponent) has proposed the development of the Touquoy Gold Mine; an open pit gold mine (the Project) located in Moose River Gold Mines in Halifax County, NS. (Figure 1, Appendix A).

Previous studies completed in support of the mine include a provincial Environmental Assessment (EA) submitted by DDV Gold Limited, a subsidiary of Atlantic Gold Corporation, on March 15, 2007, which was followed up with a Focus Report in November of the same year. D.D.V. Gold Ltd. is the Industrial Approval Holder for the Project, and remains the operative Canadian entity and owner of the Project.

The Minister of Environment approved the 2007 EA undertaking, subject to a number of conditions, in accordance with Section 13(1)b of the Environmental Assessment Regulations, pursuant to Part IV of the Nova Scotia *Environment Act*. As per condition 6.2 of the EA, the following is required:

> *The Proponent, as part of the application for Part V Approval under the Environment Act, shall provide for review and approval a Wetland Protection Plan to be developed in consultation with NSDNR Wildlife Division.*

On March 11, 2016, on behalf of the proponent, McCallum Environmental (MEL) submitted to Nova Scotia Environment (NSE) a wetland alteration application and associated supplemental information for 29 wetlands subject to alteration as a result of the Project. This application was preceded by an initial application on February 17, 2016 for two wetlands (Wetlands 20 and 21). As part of the application package, a draft wetland compensation plan (March 22, 2016) was also submitted to NSE. A wetland monitoring plan (WMP) is currently being developed and will be submitted to NSE prior to approval which is expected to be issued in early June 2016.

The purpose of the Wetland Protection Plan (WPP) is to provide an overview of methods by which wetlands existing within the development area, adjacent to the development area and down-gradient of the development area are protected. Although non-permitted wetlands (*i.e.* not planned for alteration) are a focus for protection, it is important to note that the proposed alteration activities are expected to occur over a four-year time period (2016-2019), concurrent with mine development. Therefore, the WPP will also focus on the protection of permitted wetlands (*i.e.* planned for alteration) and their associated downstream receptors during the mine construction period.

Potential impacts to wetland health will be addressed within this WPP via two main activity types:

1) Direct impacts as a result of construction activities *i.e.* cut and fill, grubbing, machinery access through wetlands, accidents and machinery malfunctions, removal of wetland vegetated buffer etc; and
2) Indirect impacts as a result of altering hydrological conditions *i.e.* removal, or reduced water inputs and outputs, reduced water storage capacity, water quality considerations etc.

The following report provides best management practices and mitigation methods to protect wetland habitat, and should be referred to in combination with the Project Environmental Protection Plan (EPP) and Wetland Monitoring Plan (WMP). The forthcoming EPP is an overarching document that will include specific mitigations, including those outlined in the WPP and WMP. The EPP will be maintained as a living document throughout all stages of the Project.

**The following recommendations are provided:**

1. A copy of this Wetland Protection Plan should be provided to NSE Environmental Assessment Branch and the regional NSE office (Bedford) in support of the Wetland Alteration Submission.
2. Contents of this Wetland Protection Plan should be communicated to all relevant staff members and construction crews, and made available at the Touquoy Gold Mine Project site.
3. This Wetland Protection Plan should be implemented in combination with the Wetland Monitoring Plan. These mitigations should be included in the EPP being prepared by the Proponent.

McCallum Environmental Ltd.

# TABLE OF CONTENTS

## 1.0 INTRODUCTION

Atlantic Gold Corporation (the Proponent) has proposed the development of the Touquoy Gold Mine; an open pit gold mine (the Project) located in Moose River Gold Mines in Halifax County, NS (Figure 1, Appendix A).

Previous studies completed in support of the mine include a provincial Environmental Assessment (EA) submitted by DDV Gold Limited, a subsidiary of Atlantic Gold Corporation, on March 15, 2007, which was followed up with a Focus Report in November of the same year. D.D.V. Gold Ltd. is the Industrial Approval Holder for the Project, and remains the operative Canadian entity and owner of the Project. More recently, on behalf of Atlantic Gold, the following reports have been submitted to Nova Scotia Environment (NSE) by McCallum Environmental (MEL) in relation to wetland habitat present within the land subject to mine development (*i.e.* the development areas).

- Wetland and Watercourse Evaluation Report (February 05, 2016) – Supporting wetland information for 33 wetlands which were identified during field 2015 assessments. Information included biophysical characteristics and functional evaluation assessment results;
- Wetland Alteration Application (February 17, 2016) – Formal submission of wetland alteration application and associated supplemental information relating to the alteration of two wetlands (Wetlands 20 and 21);
- Wetland and Watercourse Alteration Application (March 11, 2016) – Formal submission of wetland alteration application and associated supplemental information relating to remaining 29 of the 33 wetlands, as well as three watercourses planned to be altered within the development area; and
- Touquoy Wetland Compensation Plan (March 22, 2016) – The Draft Wetland Compensation Plan was formally submitted to NSE to supplement the February 17 and March 11, 2016 wetland alteration applications, and to satisfy condition 5L(ii) of the Project Industrial Approval (IA). The plan will be finalized and submitted to NSE prior to approval which is expected to be issued in early June 2016.

The Minister of Environment approved the 2007 EA undertaking, subject to a number of conditions, in accordance with Section 13(1)b of the Environmental Assessment Regulations, pursuant to Part IV of the Nova Scotia *Environment Act*. As per condition 6.2 of the EA, the following is required:

> *The Proponent, as part of the application for Part V Approval under the Environment Act, shall provide for review and approval a Wetland Protection Plan to be developed in consultation with NSDNR Wildlife Division.*

The purpose of the Wetland Protection Plan (WPP) is to provide an overview of methods by which wetlands existing within the development area, adjacent to the development area and down-gradient of the development area are protected. Although non-permitted wetlands (*i.e.* not planned for alteration) are a focus for protection, it is important to note that the proposed alteration activities are expected to occur over a four-year time period (2016-2019), concurrent with mine development. Therefore, the WPP will also focus on the protection of permitted wetlands (*i.e.* planned for alteration) and their associated downstream receptors during the mine construction period.

Potential impacts to wetland health will be addressed within this WPP via two main activity types:

1) Direct impacts as a result of construction activities *i.e.* cut and fill, grubbing, machinery access through wetlands, accidents and machinery malfunctions, removal of wetland vegetated buffer etc; and
2) Indirect impacts as a result of altering hydrological conditions *i.e.* removal, or reduced water inputs and outputs, reduced water storage capacity, water quality considerations etc.

As per IA Condition 10k), there is a requirement for the Proponent to maintain a 30 metre (m) undeveloped buffer on all adjacent watercourse and wetlands unless written authorization has been given to alter the watercourse/wetland from NSE. These indirect impacts, including those within 30m, will be minimized to the extent possible via this WPP.

## 2.0 ASSOCIATED DOCUMENTATION

This WPP has been developed to meet condition 6.2 of the 2007 EA, however additional documents will be used in combination with the WPP to ensure wetland protective measures are implemented. This section provides a brief description of these documents. Management of water within the development areas during the life span of the mine has an important role as it relates to wetland protection. Therefore, background information related to water management is also provided.

### 2.1 Project Environmental Protection Plan

A Project Environmental Protection Plan (EPP) is being developed by the Proponent as an overarching document. It incorporates the protective measures, mitigation and best management practices that will be referred to within this report. Although designed to be a general document focusing on Project activities as a whole, the EPP is intended to be used as a reference tool including specifics from the WMP and WPP to better protect wetlands within the development area, and wetlands which exist offsite that may be susceptible to indirect impacts.

The EPP will support the protection of wetlands during the construction period to:

- Manage and minimize risks and environmental effects;
- Ensure provincial, federal and municipal requirements are met;
- Provide mitigation of the potential environmental impacts due to construction activities; and,
- Provide a reference document for planning and/or conducting construction activities that may have an impact on the environment.

The EPP is intended as a living document that will be maintained and enforced by the Proponent through the life of the Project. In terms of WPP, it will include an up-to-date wetland alteration plans, wetland and surface water monitoring plans, and surface water management plans.

### 2.2 Wetland Monitoring Plan

Typically, in order to receive provincial approval to alter wetlands within Nova Scotia, NSE require the development and implementation of a post construction wetland monitoring plan (WMP). The WMP outlines the methods by which all remaining wetlands, and portions of wetlands not altered by the proposed activity (including partially altered, and unaltered adjacent wetland) are evaluated, in order to confirm that in-direct impacts have not occurred post alteration. The focus of the monitoring program is to ensure long term protection of all remaining wetland habitat, outside of the permitted alteration

footprint. As such, many similarities between the WMP and the WPP exist, and this report will reference the WMP regularly, notably as it relates to site specific discussions on a per wetland basis.

The WMP is currently being developed and will be provided to NSE prior to expected approval being issued in early June 2016. As described in the February 17 and March 11, 2016 Wetland and Watercourse Alteration Application reports, of the 31 wetlands being altered, 12 will be partially infilled. The monitoring plan will consider all remaining areas of wetland habitat associated with partially infilled locations. Due to the limited size of remaining wetland, and their proximity to the development area, an additional five partially altered wetlands have been proposed for complete infill within the March 11, 2016 wetland application. The proponent will endeavor to minimize impact to these wetlands (where practical).

Other areas that will be considered in the wetland monitoring program will include the down-stream receiving environment, including potential in-direct impacts to wetland systems between the southern development area boundary and shoreline of Scraggy Lake, and riparian wetland adjacent to Moose River as a result of up-stream alteration. In addition, consideration will be afforded to up-stream wetlands which are hydrologically connected to wetlands being altered as a result of Project construction.

The WMP will be coordinated with monitoring required for the Touquoy Mine IA and Surface Water Withdrawal Approval (pending) for Scraggy Lake. Condition 10 of the EA Approval terms and conditions, specifies thirteen surface water quality monitoring stations which will be monitored to meet the condition, and these locations and methodology for surface water quality monitoring will also be factored into the design of the wetland monitoring plan. These measures to monitoring wetlands will be part of the overall EPP.

As part of the WMP scope, an annual report will be compiled at the end of each calendar year detailing the results of the monitoring completed that year, and monitoring plans for the subsequent year. In addition to which however, the annual report will include other details related to wetland alteration associated with the project, including:

- Actual areas of wetland altered that calendar year;
- An updated schedule for the alteration areas expected for the forthcoming year; and
- Provision of updates regarding wetland compensation efforts, options, methods, and ongoing work being undertaken to satisfy the compensation requirements.

**2.3 Water Management Overview**

Maintaining pre-alteration, baseline conditions in wetland habitat is largely influenced by the supply of water it receives. Water supply sourced to wetlands beyond alteration areas is a critical factor as it relates to the success of wetland protection. This can be said for both on-site wetlands, and for wetlands which lie adjacent to, or downstream to the development areas. In addition, consideration toward up-stream wetlands which are hydrologically connected to down-stream wetlands should be taken. Changes in down-stream outflow (*i.e.* via elevation changes and/or re-direction of water via infrastructure) has the ability to alter up-stream hydrological conditions due to increased outflows, potentially leading to in-direct wetland impacts to up-stream habitats.

Runoff from each of the active mine areas will be directed into the tailings management facility (TMF) which discharges to Scraggy Lake via a polishing pond and a constructed wetland (Figure 1). Active mine

areas include the open pit area, the plant site, the waste rock storage area and the TMF itself. Storm water will be conveyed via piping, ditches and culverts as appropriate with pumping as necessary. A surface water monitoring and management plan is being prepared for construction to support the erosion and sediment control plan; which are both requirements of the existing Industrial Approval (IA), i.e., IA Condition 5e. The IA also specifically requires that wastewater and surface run off be directed to the TMF, i.e., IA Condition 9a. Surface and groundwater monitoring programs are required during all phases of the project as per the IA. These measures to manage and monitor surface water will be part of the overall Project EPP.

## 3.0 WETLAND IMPACT TYPES

The following aspects of wetland ecosystem function and characteristics have the potential to be affected in the down-gradient wetland communities as a result of site activities;

- Alteration of Wetland Hydrology: If the hydrological regime of a wetland is altered, the vegetation, character, and function of the wetland also has potential to change. Removal of on-site outflow and throughflow wetland habitat has the potential to alter the localized hydrology in the down-gradient wetlands. Hydrologically connected up-stream wetlands may also be at risk of in-direct impacts as a result of down-stream alteration activities (*i.e.* water outflow changes, land elevation changes, blasting etc). Hydrological changes can also impact the use of the wetland by wildlife as a habitat resource.
- Alteration of Water Quality: The effects of increased sedimentation as a result of up-gradient activities (*i.e.,* earth moving, removal of vegetation) has the capacity to suffocate existing plant life and increase nutrient levels in downgrade wetlands. A change in the amount of available nutrients in a wetland system in turn affects water quality and plant growth due to individual tolerance and/or preference levels associated with available nutrients. Alteration of the wetlands within the development area also increases the risk of down grade sedimentation.
- Malfunctions and Accidents: Accidental spills of contaminants in up-grade work areas has the potential to drain into down-gradient wetlands, and can cause negative impact to wetland function, and potential use of the habitat by wildlife.
- Vegetative and Habitat Integrity: Extensive ground works including activities such as blasting in, and adjacent to wetlands, has the potential to de-stabilize land surfaces and the root zone of vegetative areas including wetland buffers. Loss of vegetative cover decreases wildlife habitat availability, and also has the potential to reduce natural surface water drainage.

## 4.0 PROTECTION OF PERMITTED WETLANDS

The following section outlines wetland protection methods that will be implemented for wetlands which exist within the development areas of the Project, to which an approval for wetland alteration activities will be obtained. As previously discussed, wetland alteration activities are expected to occur over a four-year time period, concurrent with mine development activities. Therefore, some areas of wetland habitat planned for alteration may remain intact for up to three years prior to impacts taking place. Although provincial permits will allow for the alteration of these wetlands, the proponent will employ protective measures where practical, to minimize direct wetland impacts and to ensure the integrity of downstream wetlands remains intact, until such point when direct alteration is required. This will also ensure that hydrological connectivity with off-site aquatic receptors is maintained. These mitigative measures will be

integrated into the EPP which will be an up-to-date living document reflecting activities on site as the mine is constructed, operated and maintained.

### 4.1 Construction Related Protection Methods

Construction of the mine will involve multiple ground activities that will have the potential to impact existing wetland habitat within the development area. The following best management practices will be employed to ensure that the protection of wetlands within the development areas (future alteration areas) occurs. Best management practices have been provided for the pre-construction and construction phases:

#### *4.1.1 Pre-Construction Phase*

- Complete pre-construction site meetings with relevant construction staff to communicate WPP recommendations, and educate staff to watershed boundaries, direction of localized water flow, the locations of wetlands and watercourses and policies related to working around wetlands and watercourses;
- Identify and communicate schedule of construction activities as it relates to alteration of wetland habitat;
- Provide copies of relevant maps and approvals to contractor, and review all terms and conditions;
- Ensure wetland boundary flagging tape is in place prior to construction activities taking place;
- Communicate with contractor and AG staff the location of monitoring stations within remaining wetland habitat that is not approved for alteration;
- Ensure all sediment and erosion control methods are in place. Methods specifically relevant to working in proximity to wetlands and watercourses include:
    - Silt laden water is not to be drained or pumped directly into wetlands or watercourses (unless for the purposes of maintaining hydrological inputs). Instead water should be directed to heavily vegetated areas, settling ponds trenches, or similar area, with erosion control at the outlet, and the outlet must be monitored regularly by the contractor as outlined in the Project EPP;
    - Maintain existing vegetation cover whenever possible and minimize overall areas of disturbance. Also, ensure contractors minimize travel across areas of exposed soils. Maintaining existing vegetation cover is the best and most cost-effective erosion control practice;
    - All construction site and roadway runoff shall be directed through natural vegetation or through erosion and sediment control devices before it reaches watercourses or wetlands.
    - Upon final abandonment, areas that have erosion potential may be straw crimped and or matted and seeded to return the area to pre-disturbance conditions in a timely fashion;
    - Erosion control materials shall be clean, non-ore-bearing, non-watercourse derived and non-toxic materials; and,
    - Install all erosion and sediment control practices prior to any soil disturbing activities, when applicable;
    - Drainage structures will be incorporated, where necessary, to dissipate hydraulic energy and maintain flow velocities sufficiently low to prevent erosion of native soil material; and
    - Avoid frequent or unnecessary travel over erosion prone areas;

- In order to protect wetland habitat from accidental spills, ensure that the spill control and contingency planning is in effect, and its procedures fully communicated to staff; and,
- In conjunction with the WMP, ensure baseline monitoring measurements and observations have been completed prior to alteration activities taking place so that comparisons with post alteration conditions can be ascertained.

*4.1.2 Construction Phase*

- Construction crews to adhere to wetland alteration and general construction schedules;
- Maintain riparian wetland and watercourse buffers (where practical) to reduce adverse effects to wetlands, watercourses, and downstream receiving environments by clearly defining the limits of work;
- All work associated with wetland or watercourse alterations will have site-specific terms and conditions in the Approval which must be adhered to;
- Maintenance of the sediment and erosion control mitigations in place prior to each new phase of construction;
- Limit driving and use of machinery within wetland habitat where practical with use of swamp mats/corduroy bridges in wet areas to prevent rutting, diverting water flow and sedimentation;
- Ensure all development related activity (*i.e.* construction areas, access roads etc) are located within areas where biophysical field evaluations have been completed and approvals/written authorizations are in place as required, including work within 30m of a wetland or watercourse;
- Limit clearing within wetland habitat outside of approved wetland alteration areas;
- Clearing of vegetation within wetlands should occur outside of the breeding bird window where possible, otherwise nesting surveys must be completed to ensure compliance with federal legislation;
- Ensure proper fuel management by establishing and implementing spill management and contingency planning;
- For wetlands where infilling has been approved, limit to materials permitted for use as documented within applicable approval documents; and
- Complete regular construction monitoring to ensure protective measures are being implemented.

**4.2 Hydrological Related Protection Methods**

As discussed in the February 2016 Wetland and Watercourse Evaluation Report, the development area comprises of varying wetland types exhibiting a combination of water flow systems including; isolated, outflow, throughflow and inflow wetlands. Wetlands which are more likely to experience alteration as a result of a hydrological imbalance include:

- outflow wetlands (where water supply from surrounding upland habitat and groundwater discharge into the wetland is likely to be reduced or increased, or where water from connected down-stream wetland experiences alteration);
- throughflow and inflow wetlands (where water supply from up-stream wetlands, watercourses and adjacent upland habitat is likely to be reduced, or increased).

Hydrological differences are only likely to occur in isolated wetlands should run-off from surrounding upland habitats be re-directed away from the wetland location.

As outlined in Section 2.3 a surface water monitoring and management plan is being prepared for the Project and will involve re-direction of surface water flows into Project infrastructure such as the TMF. Although the majority of wetlands being altered as part of the Project will be done so via infilling, changes in the management of water as discussed in Section 2.3 may also influence the integrity of downstream (and possible up-stream) permitted wetlands (as well as non-permitted wetlands discussed further in Section 4).

Hydrological related protection measures within permitted wetlands not being immediately altered as a result of mine development will be incorporated into the construction phase where practical, however, in instances where natural hydrologic water flow into these wetlands cannot be maintained, wetland protection measures will be focused more so on the downgrade environment through implementation of sediment and erosion control methods and best management practices outlined in the Project EPP.

Hydrological protective measures as it relates to receiving, down-gradient wetland habitats would include viability of existing (pre-construction) water flows into and out of wetlands. Features such as drainage channels, swales, watercourses and sheet flow run-off will be maintained where practical. However, where this is not possible, water will be re-directed into the on-site water management infrastructure and monitoring will be completed to ensure this change in site hydrology does not affect the downstream wetland habitat.

Conversely, should it be determined that site activities in down-gradient wetlands may in-directly impact connected up-stream wetlands to which permits to alter have been obtained (*i.e.* via draining), these areas will be accounted for in the wetland alteration areas scheduled for that specific phase of work.

## 5.0 OFF-SITE WETLAND PROTECTION

Alteration of the wetlands within the development areas has the potential to affect off-site, downstream aquatic receptors as well as remaining, partially altered wetlands adjacent to the development areas. In addition, up-stream wetlands which are hydrologically connected to wetlands subject to alteration in the development area are also considered for potential in-direct impact. The following section outlines the general approach for wetland protection methods that will be employed for wetlands which exist beyond the development areas and/or are not subject to alteration as a result of project infrastructure. These mitigative measures will be integrated into the EPP which will be an up-to-date living document reflecting activities on site as the mine is constructed, operated and maintained.

### 5.1 Downstream and Upstream Wetlands

The downstream environment and aquatic receptors that will be considered for protection generally includes all wetlands that are hydrologically connected to wetlands which are being altered as a result of development activities. Therefore, since water flow across the development area is generally north to south, the following groups of wetlands will be the focus of the WPP (see attached Figure 1):

1. Wetlands located south of the development area including wetlands in-between Scraggy Lake and the southern development area boundary of the TMF; and
2. Wetlands south of the proposed open pit area.

Although limited in quantity, up-stream, non-permitted wetlands which exist in contiguity with downstream wetlands subject to alteration have been considered. Field evaluations confirm that the

headwater wetlands located at the northern extremity of the development area (*i.e.* WLs 15,19, 13,14) are not hydrologically connected to additional up-stream surface water features, therefore likelihood of in-direct impact is low. However, as part of the WMP design, potential for up-stream wetlands that exist beyond the development area boundary, and which may be connected to on-site wetlands via sub-surface flow or drainage features will be explored using desktop resources. Appropriate monitoring procedures will be put into place to evaluate potential in-direct impacts to these features (if present).

As indicated on Figure 1 (attached), wetlands which include non-permitted wetlands which exist in contiguity with downstream wetlands subject to alteration are as follows:

- Northern and eastern, remaining portions of Wetland 15;
- Northern extent of Wetland 11;
- Northern extent of Wetland 27; and
- Northern portions of Wetland 22.

Provincial alteration permits are not planned for these wetlands and as such, these wetlands must be protected from impacts as a result of upstream development activities.

Implementation of best management practices, managing water quality of effluent from TMF, and critically maintaining the supply of water into down-gradient systems will be the primary methods to ensure wetland protection. However, additional efforts will be initiated during the construction of the mine to ensure that impacts to downgrade wetlands do not occur. These may include:

- Maintenance of pre-construction hydrological flows into and out of down-stream wetland habitats, to the extent possible;
- Adhering to the Project water management plan (IA condition) including the diversion of all mine water discharge to the TMF, polishing pond and a constructed wetland as described in Section 2.3. Progressive modifications to the water management plan will be established as project activities expand, with the focus being the maintenance of natural water outputs (where practical);
- Installation of sediment and erosion control methods to ensure sediment does not enter undisturbed wetland areas and/or waterbodies connected to wetlands; and
- Completion of construction monitoring audits will be completed at down-gradient wetlands to ensure protection measures are in place and effective.

The WMP will act as the primary method by which potential impacts to down-gradient wetlands are determined. Baseline monitoring will provide data to which post-alteration observations can be compared. The approach will be outlined in the WMP which will be provided to NSE prior to approval expected to be issued in early June 2016.

**5.2 Partially Altered Wetlands**

As described in the March 11, 2016 Wetland and Watercourse Alteration Application, 12 wetlands will be partially infilled as a result of mine development within the development areas.

Partially altered wetlands are susceptible to the same post alteration, in-direct impacts to those described in Section 3.0 (*i.e.* alteration of wetland hydrology, water quality, malfunctions and accidents. Although partial infills, 5 additional wetlands (Wetlands 3, 7, 13, 23 and 25) within the development areas have been considered as complete infills in the March 11, 2016 Wetland and Watercourse Alteration

Application due to the nature of the proposed alteration, percentage of infill area, and potential for indirect impacts to the remaining wetland habitat post alteration.

Protection of remaining portions of partially altered wetlands will mirror the best management practices and mitigation methods outlined in Section 3. In addition, the WMP will consider all partially altered wetlands, including the collection of pre-alteration baseline conditions, construction monitoring and post-construction monitoring to determine potential shifts in wetland character and function. Details related to monitoring locations and procedures will be included in the WMP and submitted to NSE prior to approval expected to be issued in early June 2016.

## 6.0 RECOMMENDATIONS

1. A copy of this Wetland Protection Plan should be provided to NSE Environmental Assessment Branch and the regional NSE office (Bedford) in support of the Wetland Alteration Submission.
2. Contents of this Wetland Protection Plan should be communicated to all relevant staff members and construction crews, and made available at the Touquoy Gold Mine Project site.
3. This Wetland Protection Plan should be implemented in combination with the Wetland Monitoring Plan. These mitigations should be included in the EPP being prepared by the Proponent.

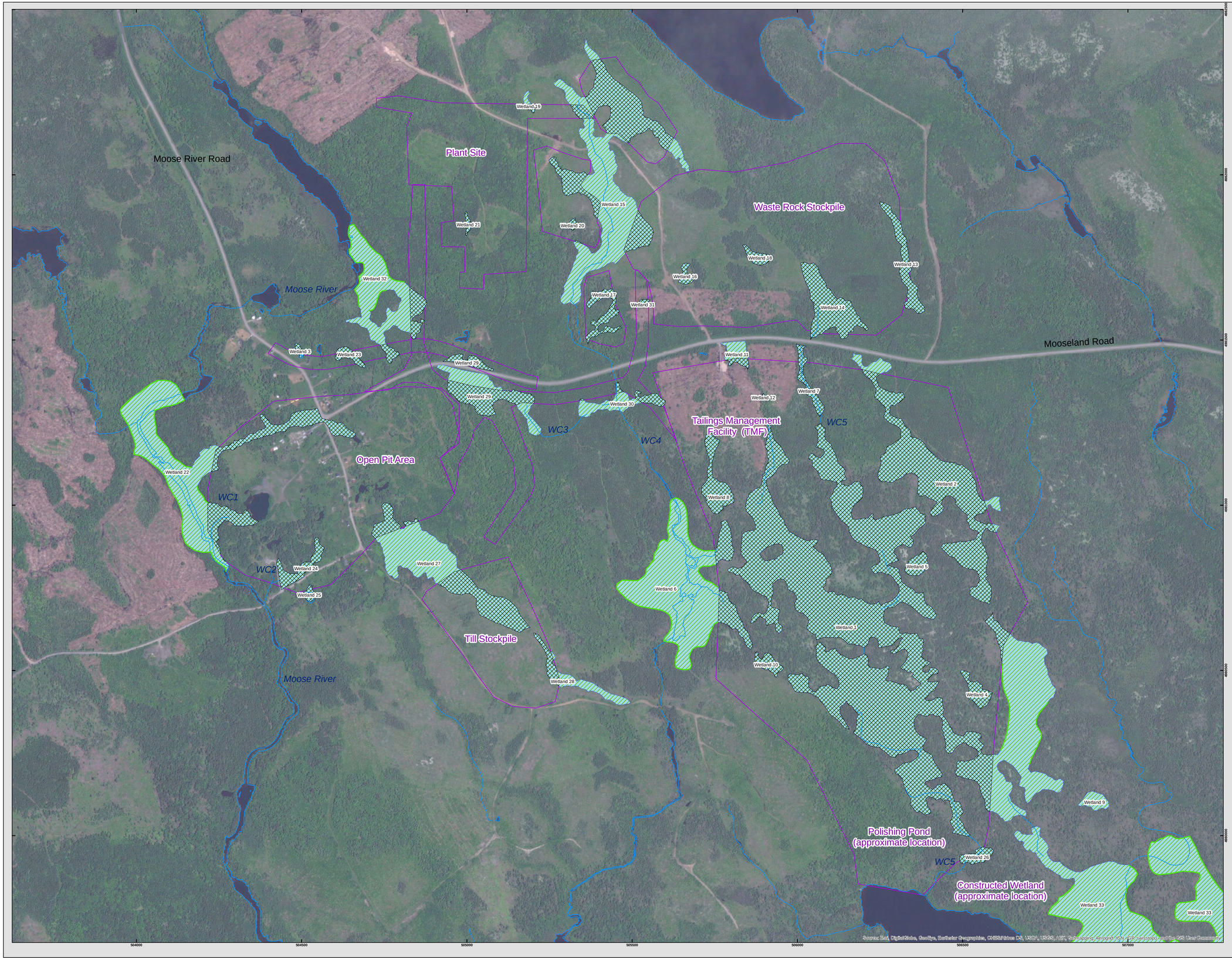
## 7.0 CLOSURE

This report has been completed for the sole benefit of Atlantic Gold Corporation. Any other person or entity may not rely on this report without the express written consent of McCallum Environmental Ltd. and Atlantic Gold Corporation.

The conclusions presented in this report represent the best judgement of the assessor based on the current environmental standards. The assessor is unable to certify against undiscovered environmental liabilities due to the nature of the investigation and the limited data available.

Should additional information become available, McCallum Environmental Ltd. requests that this information be brought to our attention immediately so that we can re-assess the conclusions presented in this report. This report was prepared by Andy Walter, BSc, Wetland Approved Evaluator and reviewed by Meghan Milloy, MES, Wetland Approved Evaluator and Vice President.

# Appendix A: Figures




Prepared For:

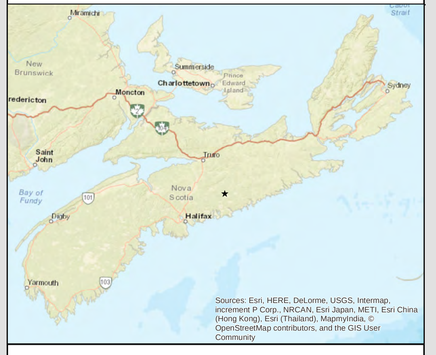
# Atlantic Gold Corporation

## FIGURE 1

Touquoy Gold Mine
Wetland Delineation Results

Moose River
Halifax County
Nova Scotia

- Watercourses
- Interpreted Wetland Boundaries
- Proposed Wetland Alterations
- Delineated Wetlands
- Proposed Infrastructure Footprint




Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 160 320 640 m

1:5,000 Scale when printed @ 36" x 24"

Drawn By: MMD Date: 4/12/2016

McCallum Environmental Ltd.

Document Name: 160323_Touquoy_24x36