

SD 17

Scraggy Lake – Withdrawal Rate with Potential Dam Breach Considerations





Memorandum

August 21, 2020

To: Jennifer Adshade

AB

From: Andrew Betts/aj/1



Ref. No.: 820933

Tel: 519-340-4101

Subject: Scraggy Lake - Withdrawal Rate with Potential Dam Breach Considerations

1. Introduction

Atlantic Gold Corporation (AGC) operates the Touquoy Mine as part of the Moose River Consolidated Project in Moose River Gold Mines, Nova Scotia (Site, Mine). The Touquoy Mine received Environmental Approval (EA) from the Nova Scotia Minister of Environment (NSE) on February 1, 2008 and Industrial Approval (IA) 2012-084244 on March 24, 2014.

AGC currently holds a water withdrawal approval (Approval No. 2017-103502-01) from NSE to extract freshwater from Scraggy Lake to meet the operational water demands of the Mine. The approval is presented in [Attachment A](#).

Scraggy Lake outlets to Fish River at the west end of the lake. The outlet is controlled by a wooden dam, which creates an artificially high lake water level and consequently a larger lake surface area and volume, compared to natural (no dam) conditions. If the dam were to fail, the lake water level would decrease, which could impact the parameters of the approval. As such, AGC has retained GHD Limited (GHD) to assess the impact of a potential dam breach or dam removal on the existing water withdrawal approval. The purpose of this memorandum is to present the approach and outcomes of the impact assessment.

2. Background

2.1 Site Description

The Touquoy Mine is located in the former Village of Moose River Gold Mines, Nova Scotia, approximately 110 km northeast of Halifax. A map of the Site showing its proximity to Scraggy Lake is presented on [Figure 1](#).

The Scraggy Lake watershed comprises 4,114 hectares (ha) of land, and is part of the Fish River-Lake Charlotte secondary watershed (1EL-5) and the Tangier primary watershed. Scraggy Lake itself is approximately 714 ha in area. The average depth of the lake is 3 – 6 m and the maximum depth of the lake is approximately 13 m at the southern end. The total estimated volume of water within the lake is 21,542,400 m³ (GHD, 2016).



The lake outlet is controlled by a 35 metre (m) long wooden dam that ranges in height from 0.6 – 0.9 m. The dam was built or refurbished approximately 30 years ago by a group of cottagers who own property on the lake. It is understood that the Department of Fisheries and Oceans Canada (DFO) provided advice to the cottage owners on dam construction with respect to the maintenance of fish passage; however, the dam construction was never approved (Carol Jacobi –pers. comm. Feb. 2016).

2.2 Freshwater Withdrawal

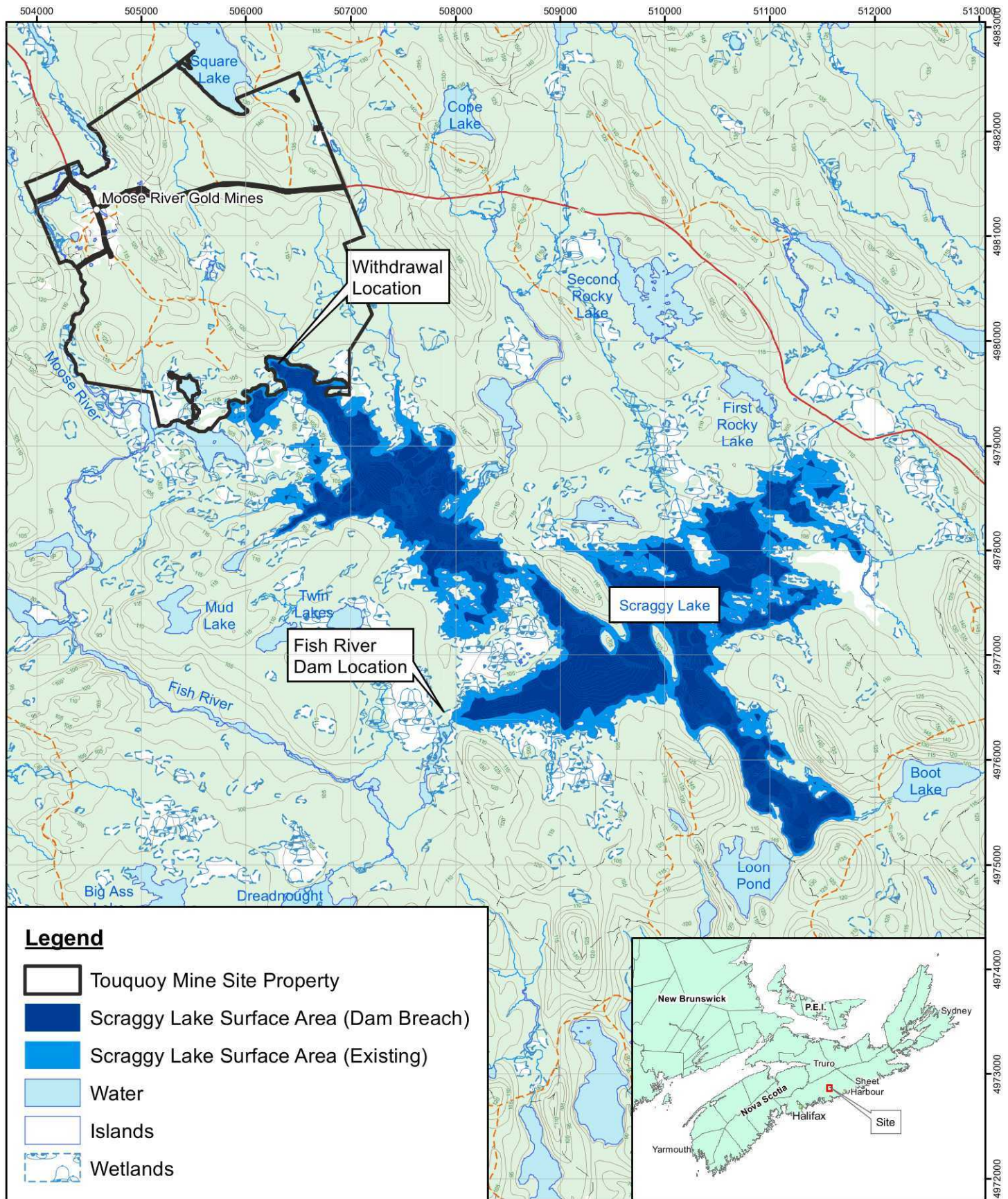
At the Mine, water is obtained from several sources including return water from the tailings management facility, direct precipitation, site runoff and groundwater inflow retrieved from the mine pit through dewatering operations. These water sources are supplemented by freshwater from Scraggy Lake in order to meet the operational water demands of the Mine.

Freshwater is currently pumped from Scraggy Lake to holding tanks at the Site for use as potable water and process water (i.e., for reagent makeup, gland seals, elution, ball mill lube cooling, fire protection). The approved water withdrawal rate from Scraggy Lake is a maximum of 50 cubic metres per hour (50 m³/hr) (720 000 L/d) during normal operating conditions for the lifespan of the project.

2.3 Freshwater Withdrawal Approvals

The Activities Designation Regulations of the *Environment Act* requires water users in Nova Scotia to obtain a water withdrawal approval from the NSE for surface water withdrawals in excess of 23,000 L/day. Water users are required to submit an application to the NSE to obtain the water withdrawal approval.

There are three categories of surface water withdrawals, which determine the requirements for the application. The application for the existing water withdrawal approval for extraction of freshwater from Scraggy Lake for the Touquoy Mine operations was classified as Category 2. In order for an application for water withdrawal from a lake to be classified as Category 2, the surface area of the lake must be larger than 5 ha, and lake water level reduction due to the withdrawal must not exceed 0.2 m.



Source: Service Nova Scotia

0 500 1,000 1,500
Metres
Coordinate System:
NAD 1983 CSRS UTM Zone 20N



ATLANTIC MINING NS CORPORATION
MOOSE RIVER GOLD MINES, NS
WATER WITHDRAWAL APPLICATION
**SCRAGGY LAKE
SURFACE AREA**

820933W (003)
Jun 9, 2020

FIGURE 1



3. Scraggy Lake Water Quantity Assessment

This section presents the approach of the impact assessment conducted to determine impact to lake levels and verify if the criteria for a Category 2 water withdrawal application would be maintained in the event of a dam breach at the Scraggy Lake outlet to Fish River.

3.1 Surveyed Elevations

The wooden dam at the Scraggy Lake outlet was surveyed, by Heavy Civil Solutions Inc, in late May to early June of 2020. A summary of the surveyed elevations is provided in [Table 3.1](#).

Table 3.1 Surveyed Shoreline Elevations (Spring 2020)

Survey Location	Minimum Elevation (m ASL)	Maximum Elevation (m ASL)
Shoreline (upstream of dam)	100.95	101.21
Shoreline (downstream of dam)	100.62	100.98
Dam (top wood)	101.16	101.37
Dam (bottom wood)	100.09	100.64

The survey indicates there is a maximum difference in water level of approximately 0.6 m across the dam.

3.2 Scraggy Lake Surface Area

As stated in Section 2, the surface area of Scraggy Lake is approximately 714 ha under existing conditions. In order to determine the surface area of the lake under a dam breach scenario it was assumed that the lake level would drop by 0.6 m, to match the Fish River water level located downstream of the dam. The lake surface area, under dam removal/breach scenario, was estimated to be 461 ha using 0.1 m interval (interpolated) bathymetric survey contours for Scraggy Lake. This represents a reduction in the lake surface area of 35% from existing conditions.

3.3 Reduction in Lake Water Levels with Withdrawal

In order to maintain a Category 2 classification under the dam breach scenario, the change in lake water level due to the water withdrawal must remain below 0.2 m. [Equation 1](#) from the Guide to Surface Water Withdrawals (NSE, November 2016) was used to calculate the change in lake water level due to the approved water withdrawal rate.

$$\text{Change in Lake Water Level (m)} = \frac{\text{Water Withdrawal (L/d)} \times 60 \text{ (d)}}{\text{Lake Surface Area (ha)} \times 10^7} \quad (1)$$

Where *Water Withdrawal* refers to the continual water withdrawal rate for the site of 720,000 L/d, and *Lake Surface Area* represents the lake surface area under a dam breach scenario of 461 ha. The results of [Equation 1](#) show that the change in lake water level under a dam breach scenario would be 0.0094 m (9.4 mm). The calculations are presented below.

$$\text{Change in Lake Water Level (m)} = \frac{720,000 \text{ (L/d)} \times 60 \text{ (d)}}{461 \text{ (ha)} \times 10^7} = 0.0094 \text{ m}$$



For reference, the calculated change in lake water level submitted as part of the existing and approved water withdrawal application was 0.006 m.

4. Conclusion

In conclusion, should a dam breach or dam removal happen in the future, the impacts of the Touquoy water withdrawal on the new lake water level will be minimal, 9.4 mm. This represents an increase in water level drop change from existing conditions (existing change of 6 mm change in lake water level from water withdrawal) of 3.4 mm.

In addition, the classification of the existing water withdrawal approval for the extraction of freshwater from Scraggy Lake would remain as Category 2 in the event of a dam breach at the lake outlet.

5. References

GHD. (2016). *Water Withdrawal Application Supporting Document, Tuoquoy Mine, Moose River Consolidation Project, Moose River Gold Mines, Halifax County, Nova Scotia*. Project No. 820933. Report No. 12. February 16, 2016.

Nova Scotia Environment (NSE). (2016). *Guide to Surface Water Withdrawal Approvals*, <https://www.novascotia.ca/nse/water/docs/guideToSurfaceWaterWithdrawalApprovals.pdf>, Accessed Jun. 2020.

Attachment A

APPROVAL

**Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1 s.1**

APPROVAL HOLDER: ATLANTIC MINING NS CORP.

SITE PID: 00437707

APPROVAL NO: 2017-103502-01

EXPIRY DATE: July 2, 2027

Pursuant to Part V of the *Environment Act*, S.N.S. 1994-95, c.1 s.1 as amended from time to time, approval is granted to the Approval Holder subject to the Terms and Conditions attached to and forming part of this Approval, for the following activity:

Water Approval - Water Withdrawal

A handwritten signature in black ink, appearing to read "Kevin G Garroway".

Administrator: Kevin G Garroway

Effective Date: May 3, 2019

The Minister's powers and responsibilities under the Act with respect to this Approval have been delegated to the Administrator named above. Therefore, any information or notifications required to be provided to the Minister under this Approval can be provided to the Administrator unless otherwise advised in writing.

TERMS AND CONDITIONS OF APPROVAL

Nova Scotia Environment

Approval Holder: ATLANTIC MINING NS CORP.

Project: Scraggy Lake - PID 00437707

Site:

PID	Civic #	Street Name	Street Type	Community	County
00437707				MOOSELAND	HALIFAX COUNTY

Approval No: 2017-103502-01

File No: 95100-30-BED-2017-103502

Grid Reference: Easting - 506200, Northing - 4979845

Reference Documents

- Application submitted January 21, 2019 and attachments.
- E-mail correspondence, J. Millard, AMNS, to M. Haggart, NSE, dated June 28, 2017
- Letter, A. Betts, R. Leppington, GHD, on behalf of Atlantic Gold Corporation, to C. Burbidge, Fisheries and Oceans Canada, '19-HMAR-00022 Response to request for additional information', dated March 13, 2019
- Letter, C. Burbidge, Fisheries and Oceans Canada, to J. Millard, AMNS, 'Scraggy Lake Touquoy Gold Mine - Water Withdrawal.....' dated March 18, 2019
- Application submitted April 26, 2017 and attachments.

1. Definitions

- "Act" means the Environment Act S.N.S. 1994-1995, c.1, s.1 and includes all regulations made pursuant to the Act.
- "Activity" means the withdrawal of surface water from Scraggy Lake.
- "Administrator" means a person appointed by the Minister for the purpose of this Act, and includes an acting administrator.

- d. "Department" means the Central Region, Bedford District Office, of Nova Scotia Environment located at the following address:

Nova Scotia Environment
Inspection Compliance and Enforcement Division
30 Damascus Road, Suite 115
Bedford, NS B4A 0C1
Phone: 902-424-7773
Fax: 902-424-0597

- e. "Facility" means the water withdrawal at Scraggy Lake and associated works.
- f. "Fisheries and Oceans Canada (DFO)" means the Fisheries Protection Program of the Referrals Secretariat located at the following address:

Referrals Secretariat
Fisheries Protection Program
Fisheries and Oceans Canada
PO Box 1006
Dartmouth, NS B2Y 4A2
Phone: 902-426-3909
Fax: 902-426-1489

- g. "Minister" means the Minister of Environment.
- h. "Watercourse" means the bed, bank, and shore of every river, stream, lake, creek, pond, spring, lagoon or other natural body of water, and the water therein, within the jurisdiction of the Province of Nova Scotia, whether it contains water or not, and all groundwater.

2. Scope

- a. This Approval (the "Approval") relates to the Approval Holder(s) and their application and supporting documentation, as listed in the reference documents above, to withdraw water from Scraggy Lake situated at or near PID: 00437707.

3. General

- a. The Approval Holder(s) shall operate the water withdrawal including installation of intake structures in accordance with provisions of the most recent version of:
 - i. Environment Act S.N.S. 1994-1995, c.1, s.1 as amended from time to time
 - ii. Regulations pursuant to the above Act, as amended from time to time
- b. Nothing in this Approval relieves the Approval Holder(s) of the responsibility for obtaining and paying for all licenses, permits, approvals or authorizations

necessary for carrying out the work authorized to be performed by this Approval which may be required by municipal by-laws or provincial or federal legislation. The Minister does not warrant that such licenses, permits, approvals or other authorizations will be issued.

- c. No authority is granted by this Approval to enable the Approval Holder(s) to operate the water withdrawal on lands which are not in the control or ownership of the Approval Holder(s). It is the responsibility of the Approval Holder(s) to ensure that such a contravention does not occur. The Approval shall provide, to the Department, proof of such control or ownership upon expiry of any relevant lease or agreement. Failure to retain said authorization may result in this Approval being cancelled or suspended.
- d. If there is a discrepancy between the reference documents and the terms and conditions of this Approval, the terms and conditions of this Approval shall apply.
- e. The Minister may modify, amend or add conditions to this Approval at any time pursuant to Section 58 of the Act.
- f. This Approval is not transferable without the consent of the Minister.
 - i. If the Minister determines that there has been non-compliance with any or all of the terms and conditions contained in this Approval, the Minister may cancel or suspend the Approval pursuant to subsections 58A(1) and 58A(2) of the Act, until such time as the Minister is satisfied that all terms and conditions have been met
 - ii. If the Minister cancels or suspends this Approval, the Approval Holder(s) remains subject to the penalty provisions of the Act and regulations
- g. The Approval Holder(s) shall notify the Department prior to any proposed extensions or modifications of the activities outlined in the original Application for Approval.
- h. Pursuant to Section 60 of the Act, the Approval Holder(s) shall submit to the Minister any new and relevant information respecting any adverse effect that actually results, or may potentially result, from any activity to which the Approval relates and that comes to the attention of the Approval Holder(s) after the issuance of the Approval.
- i. The Approval Holder(s) shall immediately notify the Department of any incidents of non-compliance with this Approval.
- j. The Approval Holder(s) shall bear all expenses incurred in carrying out the environmental monitoring required under the terms and conditions of this Approval.
- k. Unless specified otherwise in this Approval, all samples required to be collected

by this Approval shall be collected, preserved and analysed, by qualified personnel, in accordance with recognized industry standards and procedures.

- l. Unless written authorization is received otherwise from the Minister, all samples required by this Approval shall be analysed by a laboratory that meets the requirements of the Department's Policy on Acceptable Certification of Laboratories as amended from time to time.
- m. Unless written authorization is received otherwise from the Minister, all samples required by this Approval shall be analysed by a laboratory that meets the requirements of the Department's Policy on Acceptable Certification of Laboratories as amended from time to time.
- n. The Approval Holder(s) shall submit any monitoring results or reports required by this Approval to the Department. Unless specified otherwise in this Approval, all monitoring results shall be submitted within 30 days following the month of monitoring.
- o. Failure to comply with the terms and conditions is an offence under the Environment Act.

4. Covenant Conditions

- a. The Approval Holder(s) may withdraw water as authorized and, without limiting the generality of the foregoing, shall not alter or use the watercourse so as to:
 - i. prejudice any riparian rights of any owner or of any person lawfully in possession of or holding any lands abutting the watercourse or any rights therein
 - ii. suffer any loss, damage or nuisance to adjacent or abutting lands
- b. The Approval Holder(s) shall not, at any time or for any purpose, place a pecuniary value on or claim any pecuniary value for the rights and privileges granted by this Approval, whether considered alone or in conjunction with any other property rights or privileges, over and above the amounts, if any, actually paid to the Minister by the Approval Holder(s) for said rights and privileges.
- c. It is recognized and agreed that this Approval does not give sole or exclusive rights to any watercourse, and the Minister reserves the right to use the watercourse and water therein for any purpose and to allow others to use the watercourse and water for any purpose, provided that such use or purpose does not constitute a substantial interference with the rights granted to the Approval Holder(s).
- d. The Approval Holder(s) shall be responsible for obtaining and paying the costs of any and all approvals, services, easements, rights of way and authorizations of any kind necessary for the performance of any activities undertaken pursuant to

this Approval. The Minister does not covenant that such approvals, services, easements, rights of way and authorizations of any kind will be issued by the Province of Nova Scotia, any other body or person.

- e. The Approval Holder(s) shall maintain any bridge, culvert, dam, sluice, flume, conduit, intake or other structure built or used in or on the watercourse in a state of good repair and in a clean and tidy condition to the satisfaction of the Minister. The Approval Holder(s) shall conform to any and all directions of the Minister concerning the rehabilitation of a watercourse or the construction, reconstruction, maintenance, removal, operation and location of any bridge, culvert, dam, sluice, flume, conduit or other structure built, used or maintained in and on the watercourse.
- f. The Approval Holder(s) shall indemnify and save harmless the Minister against any loss, cost or damage occasioned by the Approval Holder(s)'s relocation of a watercourse or the construction of, repair, alteration or addition to any culvert, bridge, dam, sluice, flume, conduit, intake or other structure. Such indemnity shall include, but not be restricted to, all losses, costs or damages occasioned by the improper or faulty relocation of a watercourse or the improper or faulty construction of repair, alteration or addition to any culvert, bridge, dam, sluice, flume, conduit or other structure in or on the watercourse, or by any trespass, negligence or willful act of the Approval Holder(s) or any employees, agents, contractors, or guests of the Approval Holder(s).
- g. On the expiry or termination of this Approval or at the end of the useful life of the structure, as determined by the Minister, the Approval Holder(s) shall immediately cease operations and peaceably and quietly yield up and deliver possession of the watercourse in a condition satisfactory to the Minister, and the Minister shall incur no further expense, liability or cost in this regard.
- h. The Approval Holder(s) shall remove any bridge, culvert, dam, sluice, flume, conduit, intake or other structure or remnants thereof, and any equipment or personal property built, used or maintained in and on the watercourse at the end of the useful life of the structure, to the satisfaction of the Minister. In the event the Approval Holder(s) fails to remove such bridge, culvert, dam, sluice, flume, conduit or other structure or remnants thereof and any equipment or personal property, the Minister may, without any attaching liability, remove or demolish the same in whatever manner the Minister deems necessary. The Approval Holder(s) shall pay all expenses and costs of such removal or demolition.
- i. The Minister or any employee, servant or agent of the Department will not be liable for any damage, loss or claim of any kind which may or hereafter arise.
- j. If the Approval Holder(s) assigns or sublets their Approval or any part thereof except as is expressly provided herein, if the contractor becomes bankrupt or insolvent, if a receiver is appointed for any part of the assets of the Approval

Holder(s), if any assignment is made for the benefit of the creditors of the Approval Holder(s), or if it is wound up or goes into liquidation, the Minister may terminate the Approval.

- k. This Approval shall ensure to the benefit of and be binding upon the Minister, the Minister's successors, assigns and authorized representatives, and upon the Approval Holder(s), and the heirs, administrators, executors and assigns of the Approval Holder(s).
- l. The failure of the Minister to insist upon a strict performance of any covenant, proviso or terms and conditions contained in this Approval shall not be deemed a waiver of any rights or remedies that the Minister may have and shall not be deemed a waiver of any subsequent breach or default in the covenants, provisos or terms and conditions contained in this Approval.

5. Site Specific Conditions

- a. Expiry: This Approval expires July 2, 2027, unless otherwise extended by the department.
- b. Water Withdrawal Limits: The rates and volumes of water withdrawal from Scraggy Lake shall not exceed the limits set out in Table 1, Appendix A.
- c. If there is to be any increase in water withdrawal rates from the rates approved in this Approval, at least 120 days prior to the date on which the modified withdrawal rates will occur, the Approval holder shall apply for an amendment to this Approval. The application shall include complete supporting information as required by the Nova Scotia Environment 'Guide to Surface Water Withdrawal Approvals'.
- d. Fees: The Approval Holder shall, upon receipt of an invoice from the Minister of Nova Scotia Environment stating the amount owing, pay to the Minister of Finance the amount stipulated in said invoice. Said amount shall be in accordance with the schedule of fees established by the Minister of Nova Scotia Environment, as may be revised from time to time. The Approval holder shall accept that invoicing is based upon the approved maximum water withdrawal rates during the billing period and not upon water actually withdrawn during the billing period.
- e. Requirements for Watercourse Alteration: No work which will disturb the bed and bank of the watercourse is authorized by this Approval. Prior to undertaking any construction activity in the bed or banks of a watercourse to install or maintain an intake and/ or a fish screen, the Approval holder shall obtain any watercourse alteration construction Approvals or any Notification receipts which may be required pursuant to the Activities Designation Regulations and the Approval and Notification Procedures Regulations.

- f. Intake Maintenance: The Approval Holder shall maintain a water intake structure and infiltration gallery which meets all requirements of Fisheries and Oceans Canada for the prevention of fish entrainment or entrapment or other adverse effects to fish.
- g. Modifications: No less than 30 days prior to any modification or replacement of the pumping equipment or intake, the Approval holder shall provide written notification and detailed specifications of the modified equipment to the Department. The Approval holder shall adhere to any direction provided by the Department regarding installation and operation of the modified equipment, including making an application for Approval amendment if required.
- h. Flow Meter Installation: Before commencing water withdrawal under this Approval, and at all times, the Approval holder shall install and maintain a flow meter which is capable of recording the instantaneous flow of water and totalizing all withdrawal of water on the water line at the intake.
- i. Flow Meter Calibration and Records: The flow meter shall be maintained and calibrated in accordance with the manufacturer's specifications. A record shall be kept of the date of each calibration, the person conducting it and their qualifications for flow meter calibration, and shall be retained on site for a minimum of 5 years after being recorded. This record shall be made available to the Department within 24 hours of a request.
- j. Flow Meter Re-calibration upon Request: The Approval holder shall ensure the flow meter is re-calibrated in accordance with the manufacturer's specifications, within 30 days of a request by the Department.
- k. Monitoring: Commencing no later than the first day of water withdrawal under this Approval, the Approval holder shall keep daily records of the following:
 - i. Flow totalizing meter reading
 - ii. Daily water withdrawal rate
 - iii. The maximum instantaneous withdrawal rate for the day
 - iv. The total volume of water withdrawn for the applicable withdrawal period (as required by Table 1 in Appendix A).
- l. Records: The daily records of water withdrawal from Scraggy Lake shall be retained on site for a minimum of 5 years after being recorded and shall be made available to the Department immediately upon request.
- m. Wet Well: The Approval holder shall inspect the wet well at the water intake once per day for the presence of fish and shall record the observation in a digital spreadsheet. In the event that fish are observed in the wet well or are otherwise

entrained in the water flow, all pumping shall immediately cease and the Approval holder shall notify Fisheries and Oceans Canada and the Department that fish are present in the wet well. The Approval holder shall undertake all further measures necessary to the satisfaction of Fisheries and Oceans Canada and the Department to prevent the entrainment or entrapment of fish at the water intake.

- n. Staff Gauge and Level Logger Installation: The Approval holder shall install and maintain two (2) permanent staff gauges and a level logger in Scraggy Lake. The level logger shall be installed at a suitable location adjacent to the water extraction point. The staff gauges and level logger shall be installed in a location and manner that part of the staff gauge or level logger remains submerged at all times and can be read reliably during all low flow conditions, at the following locations:
 - i. at the nearest suitable location to the extraction point, and:
 - ii. at the outlet of Scraggy Lake immediately upstream from the outlet (dam structure) of Scraggy Lake to Fish River.
- o. Shoreline Disturbance: The Approval holder shall ensure that any shoreline disturbance required to install and maintain staff gauges and/or level loggers is authorized by the landowner.
- p. Survey of Staff Gauges: By no later than August 1, 2017, a fixed point on the staff gauges shall be surveyed in relative to a fixed point of known elevation on the shoreline by a qualified surveyor. The staff gauges shall be marked with units in centimetres. Alterations of any kind shall not be made to the staff gauge following the survey. If for any reason the staff gauge is dislodged, the Approval Holder shall immediately notify NSE, shall record this event in the water level log, and shall immediately re-establish the gauge under the direction of a qualified surveyor, such that the fixed point on the staff gauge corresponds with the same elevation as it did in the initial survey.
- q. Operational Pumping Monitoring Equipment: After November 30, 2017, or after the rate of pumping from Scraggy Lake is reduced to 720,000 litres per day, whichever comes first, and for the duration of this Approval, the staff gauges shall be maintained at the extraction point and outlet of Scraggy Lake for the duration of this Approval. A level logger shall be maintained at the extraction point year round.
- r. Operational Water Levels: After November 30, 2017, or after the rate of pumping from Scraggy Lake is reduced to 720,000 litres per day, whichever comes first, and for the duration of this Approval, the Approval holder shall keep a daily record of the water level in Scraggy Lake at the extraction point in a digital spreadsheet.

- i. Water levels shall be recorded hourly with the level logger at the extraction point. Data from the level logger shall be downloaded at least monthly. Hourly water level data shall be corrected based on staff gauge readings and recorded in a spreadsheet in addition to the staff gauge readings.
 - ii. Data shall be retained for a minimum of 5 years and shall be provided to the Department within 24 hours of a request.
- s. Outlet Staff Gauge: After November 30, 2017, or after the rate of pumping from Scraggy Lake is reduced to 720,000 litres per day, whichever comes first, and for the duration of this Approval, during the period from June 1 to October 15 annually, the Approval holder shall monitor and record the water level on the staff gauge at the outlet of Scraggy Lake at least monthly. The geodetic elevation of the water levels shall be calculated at least monthly. Water level shall be recorded in a digital spreadsheet.
- t. Dam Condition: Starting by no later than August 1, 2017, and for the duration of this Approval, during the period from June 1 to October 15 annually, the Approval holder shall make a visual observation and photographic record of the condition of the dam at the outlet of Scraggy Lake at least monthly. The Approval holder shall note any changes in the condition of the dam relative to the previous months. The photograph and accompanying visual observations about the condition of the dam shall be retained on Site in digital format and provided to the Department immediately upon request.
- u. Dam Failure: In the event of a failure or significant deterioration of the existing dam structure at the outlet of Scraggy Lake, resulting in a significant change in water levels in Scraggy Lake, the Approval holder shall immediately notify the Department within 72 hours of the observation and within 90 days shall develop an action plan acceptable to the Department to limit any adverse effect on fish and other users of the watercourse resulting from withdrawal of water from Scraggy Lake. The action plan shall be developed in consultation with Fisheries and Oceans Canada, the Community Liaison Committee established pursuant to Industrial Approval #2012-084244 (and any subsequent renewals or amendments), the landowners surrounding Scraggy Lake including landowners at the location of the existing dam, and the Department.
- v. Dam Management: As part of any application for renewal of this Approval, the Approval holder shall provide a proposal to the Department to manage the existing dam at the outlet of Scraggy Lake to ensure adequate downstream flows and fish passage, for review and Approval. The proposal shall be prepared in consultation with Fisheries and Oceans Canada, the Community Liaison Committee established pursuant to Industrial Approval #2012-084244 (and any subsequent renewals or amendments), the landowners surrounding Scraggy Lake including landowners at the location of the existing dam, and the Department.

- w. Complaints: In the event of any complaints which the Approval holder receives about water levels in Scraggy Lake, the Approval holder shall notify the Community Liaison Committee pursuant to Industrial Approval #2012-084244 and any subsequent renewals or amendments, and shall provide the Department with a copy of a written response to the complainant and any feedback received from the Community Liaison Committee within the annual report for the Facility, or immediately upon request by the Department.
- x. Records and Reporting: The Approval holder shall provide a report on all monitoring and records required by this Approval to the Department, on or before April 30 annually.
 - i. The report shall include all monitoring data required by this Approval, presented in a spreadsheet format, electronically and in printed copy.
 - ii. The report shall include a detailed comparison of monitoring results to Approval limits as established in Appendix A and an evaluation of whether all results demonstrate compliance with Approval conditions. The evaluation of compliance shall also be presented in a summary statement at the beginning of the report and shall be signed by an authorized representative of the Approval holder who is also a professional engineer or geoscientist licensed to practice in Nova Scotia.
 - iii. The report shall include a record of any complaints received about the water levels in Scraggy Lake.
- y. Fisheries: This Approval does not permit you to cause serious harm to fish that is prohibited by the Fisheries Act (Canada) or cause impacts to aquatic species at risk that are prohibited by the Species at Risk Act (Canada). It is your responsibility to ensure that your project does not contravene the Fisheries Act (Canada) or the Species at Risk Act (Canada). Fisheries and Oceans Canada may assess your project to determine whether your work, activity or undertaking is likely to contravene the the Fisheries Act (Canada) or the Species at Risk Act (Canada). It is also your duty to Notify DFO if you have caused, or are about to cause, serious harm to fish. Further information on your responsibilities under the Fisheries Act (Canada) or the Species at Risk Act (Canada) is available at <http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html>

APPENDIX A

Table 1: Water Withdrawal Limits

Period of withdrawal	Year round
Daily duration of withdrawal	14.4 hours
Frequency of withdrawal	Daily
Average daily withdrawal rate	720,000 litres per day
Maximum daily withdrawal rate [#]	720,000 litres per day
Maximum instantaneous withdrawal rate	13.89 litres per second
Maximum volume of withdrawal (annual)	262,800,000 litres

[#] Maximum daily withdrawal rate is based on each 24 hours