

Permits

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Subject: MV2015L2-0003 - NATCL - draft Water Licence
Attachments: MV2015L2-0003 - NATCL - draft WL - Sept 2015.pdf; MV2015L2-0003 - NATCL - WL Renewal - Work Plan.pdf

All –

Please find attached a draft Water Licence for NATCL's MV2015L2-0003 application to renew MV2002L2-0019. A updated work plan is also attached. **Comments and recommendations on the draft Water Licence are due by 5pm October 7, 2015.**

Please let Julian and myself know if you have questions.

Cheers-

Jen

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Please note: All correspondence to the Board, including emails, letters, faxes and attachments are public documents and may be posted to the public registry.



Draft
Type A Water Licence MV2015L2-0003
North American Tungsten Corporation Ltd. – Cantung Mine

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Part A: Scope and Definitions

1. Scope:

a) This Licence entitles ~~North American Tungsten Corporation Ltd. (hereafter the "Licensee")~~ to use Water and dispose of Waste for ~~a~~ mining and milling ~~undertaking~~, and associated uses at the Cantung Mine, Northwest Territories (Latitude - 61° 57'N; Longitude - 128° 16' W) ~~including: - as described in the complete Water Licence Application and attachments dated February 6, 2008, and subsequent Information Requests, responses dated May 20, 2008 and July 17, 2008; and subsequent Amendment Applications and related documents. Specifically, this Licence authorizes the following activities:~~

- i. Withdrawal of Water for continued mining and milling operations through the Water Supply Facility;
- i. Withdrawal of Water for domestic purposes through the Water Supply Facility;
- ii. Deposit of Waste through the Tailings Containment Area, Dry Stack Tailings Storage Facilities, and underground;
- iii. Deposit of Waste through the Wastewater Treatment Facilities;
- iv. Deposit of Waste through the Solid Waste Disposal Facility and Landfarm;
- v. Disposal of Waste Rock in underground workings and above ground;
- vi. Disposal of Sewage;
- vii. Handling and storage of petroleum products and hazardous materials;
- viii. Operation and maintenance of Sewage Disposal Facilities;
- ix. Operation and maintenance of Wastewater Treatment Facilities;
- x. Operation and maintenance of Dry Stack Tailings Processing Facility;
- xi. Operation and maintenance of Dry Stack Storage Facilities;
- xii. Operation and maintenance of Tailings Containment Area;
- xiii. Operation and maintenance of Solid Waste Disposal Facilities and Landfarm; and
- xiv. Progressive Reclamation and associated closure activities.

~~These activities are described in submissions to the Mackenzie Valley Land and Water Board, including, but not limited to:~~

- ~~xv. The complete Water Licence renewal Application received April 21, 2015;~~
- ~~xvi. The complete Water Licence Application and attachments dated February 6, 2008, subsequent Information Requests, and Information Request responses dated May 20, 2008 and July 17, 2008; and~~
- ~~xvii. Amendment Applications and related documents submitted after the February 6, 2008 Water Licence Application.~~

~~If any discrepancy or conflict results from reference to the submissions in subparagraphs xv to xvii the contents of the more recent document shall prevail.~~

b) ~~This Licence is issued subject to the conditions contained herein with respect to the taking of Water and the depositing of Waste of any type in any Waters or in any place under any conditions where such Waste or any other Waste that results from the deposit of such Waste may enter any Waters. Whenever new Regulations are made or existing Regulations are amended by the Commissioner in Executive Council under the Act, or other statutes imposing more stringent conditions relating to the quantity or type of Waste that may be so deposited or under which any such Waste may be so deposited, this Licence shall be deemed, upon promulgation of such Regulations, to be automatically amended to conform with such Regulations.~~

c) ~~The Licensee shall take every reasonable precaution to protect the environment.~~

Commented [Staff1]:

Board staff have modernized this draft Licence to better concord with more recently issued Licences. Comment bubbles have been used to identify the conditions from the current Licence MV2002L2-0019.

Commented [Staff2]: Old B.1

- d) In conducting its activities under this Licence, the Licensee shall make best efforts to consider and incorporate any scientific and Traditional Knowledge that is made available to the Licensee.
- e) Compliance with the terms and conditions of this Licence does not relieve the Licensee from responsibility for compliance with the requirements of any applicable federal, territorial or municipal legislation.

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2. Definitions:

Acid/Alkaline Rock Drainage - the production of acidic ~~or alkaline~~ leachate, seepage or drainage from underground workings, ore piles, Waste Rock, Tailings, or overburden that can lead to the release of metals to ~~groundwater~~Groundwater and surface Water during the life of the ~~mine~~Project and after closure.

Act - the *Waters Act*, S.N.W.T. 2014, c. 18.

Action Level - ~~a predetermined qualitative or quantitative trigger event which, if met exceeded, requires the Licensee to take appropriate actions including, but not limited to: further investigations, changes to operations, or enhanced mitigation measures and reporting of same.~~

Analyst - an Analyst designated by the Minister under subsection 65(1) of the Act.

Aquatic Effects Monitoring Program (AEMP) - ~~a monitoring program designed to determine the short- and long-term effects in the Receiving Environment resulting from the Project; to evaluate the accuracy of impact predictions; to assess the effectiveness of planned impact mitigation measures; to identify additional impact mitigation measures to reduce or eliminate environmental effects; and as further described in Part H, item 1.~~

~~**Average Concentration** - the discrete average of four (4) consecutive analytical results, or if less than four (4) analytical results, the discrete average of the analytical results collected during a batch decant, as submitted to the Board in accordance with the sampling and analysis requirements specified in the Surveillance Network Program.~~

Commented [Staff3]: See Maximum Average Concentration and Maximum Grab Concentration

Board - the Mackenzie Valley Land and Water Board established by subsection 99(1) of the ~~Mackenzie Valley Resource Management~~ Act.

Closure and Reclamation Plan - ~~a document developed in accordance with this Licence and the Mackenzie Valley Land and Water Board and Aboriginal Affairs and Northern Development Canada's November 2013, or amended editions, Guidelines for the Closure and Reclamation of Advances Mineral Exploration and Mine Sites in the Northwest Territories, that clearly describes the closure and reclamation activities for the Project, and encompasses the interim and final versions of the Plan.~~

Dam Safety Guidelines - the *Canadian Dam Association's (CDA) Dam Safety Guidelines (DSG)*, 2007, or amendments. The scope and applicability of the ~~Dam Safety Guidelines DSG~~ referred to in this Licence, is presented in Section 1 of the ~~Dam Safety Guidelines DSG~~.

Discharge - ~~the direct or indirect release of any Water or Waste to the Receiving Environment.~~

Dry Stack Tailings Processing Facility - the infrastructure ~~and associated area~~ designed to filter and dewater Tailings prior to disposal in the Dry Stack Tailings Storage Facilities.

Dry Stack Tailings Storage Facilities - ~~comprises~~ the ~~following~~ Engineered Structures designed to contain filtered Tailings: Tailings Storage Facilities (TSF) 4b, 6, and 7.

Engagement Plan - ~~a document, developed in accordance with this Licence and the Board's June 2013, or amended editions, Engagement and Consultation Policy and the Engagement Guidelines for Applicants and Holders of Water Licences and Land Use Permits, that clearly describes proposed engagement activities during the life of the Project.~~

Engineered Structures - ~~any structure or facility and the associated area related to Water Use or the deposit of Waste that is normally designed and approved by a Professional Engineer.~~

Flat River Tailings - the historical Tailings that were deposited into the Flat River.

Freeboard - the vertical distance between Water line and the effective Water containment crest on a dam or dyke's upstream slope.

Groundwater - all Water below the ground surface.

~~ICP Metal Scan~~ - ~~elements detected by an inductively coupled plasma mass spectrometer, including but not limited to, aluminium, barium, boron, cadmium, chromium, copper, iron, lead, manganese, molybdenum, nickel, selenium, strontium, uranium and zinc.~~

Inspector - an Inspector designated by the Minister under subsection 65(1) of the Act.

Interim Closure and Reclamation Plan - a document developed in accordance with this Licence and the Mackenzie Valley Land and Water Board and Aboriginal Affairs and Northern Development Canada's November 2013, or amended editions, *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories* that clearly describes the plans for closure, remediation and reclamation of the Project site.

Landfarm - the ~~area and associated~~ Engineered Structure and associated area designed to contain and treat hydrocarbon contaminated ~~soils~~ materials.

Licensee - ~~the holder of this Licence.~~ North American Tungsten Corporation Ltd.

Maximum Average Concentration - the running average of any four (4) consecutive analytical results submitted to the Board in accordance with the sampling and analysis requirements specified in the Surveillance Network Program.

Maximum Grab Concentration - a concentration of a parameter listed in the Licence that cannot be exceeded in any one (1) grab sample.

Metal Leaching - ~~the potential for leaching of metals from Tailings, Waste Rock or stockpiles when in contact with any Water.~~ the production of leachate under neutral or alkaline conditions by seepage or drainage from underground workings, ore piles, Waste Rock, Tailings, or overburden, in either disturbed or undisturbed conditions, that could lead to the release of metals to groundwater Groundwater and surface water during the life of the Project and after closure.

Minister - a duly appointed member of the Executive Council who is responsible for the Waters Act or the department responsible for administering that Act.
~~a member of the NWT Executive Council who is appointed as Minister under the Legislative Assembly and Executive Council Act and who is responsible for the enactment of the Waters Act.~~

Minewater - Groundwater, surface Water, or any Water used in mining which is pumped or flows out of any underground workings or open pit.

Modification - ~~means an alteration to a physical work that introduces a new structure or eliminates an existing structure and does not alter the purpose or function of the work, but does not include an expansion;~~ in respect of a structure, means a change, other than an expansion, that does not alter the purpose or function of a structure.

Professional Engineer - a person who is registered with the Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists (NAPEG) in accordance with the Engineering and Geoscience Professions Act, S.N.W.T. 2006, c.16, or amendments, as a

Professional Engineer, and whose principal field of specialization is appropriate to address the components of the project at hand.

~~“Engineer” means a professional Engineer registered to practice in the Northwest Territories in accordance with the *Engineering and Geoscience Professions Act*, S.N.W.T. 2006, c.16;~~

Professional Geoscientist - a person who is registered with the Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists (NAPEG) in accordance with the Engineering and Geoscience Professions Act, S.N.W.T. 2006, c.16, or amendments, as a Professional Geoscientist, and whose principal field of specialization is appropriate to address the components of the project at hand.

~~“Geoscientist” means a professional Geoscientist registered to practice in the Northwest Territories in accordance with the *Engineering and Geoscience Professions Act*, S.N.W.T. 2006, c.16;~~

Progressive Reclamation - activities conducted during the operating period of the ~~mine-Project~~ to modify and reclaim the land and Water affected by the ~~Project-licensed undertaking~~ to the satisfaction of an Inspector~~the Board~~.

Project – the Cantung Mine Project as described in Part A, item 1 of this Licence.

Regulations - the Regulations proclaimed pursuant to section 63 of the Act.

Receiving Environment - the aquatic environment that receives any Water or Waste released from the Project.
~~for the purpose of this Licence, the natural aquatic environment outside ... that received any deposit or Discharge of Waste, including Seepage, runoff, or Wastewater, from the Project.~~

Response Framework - a systematic approach to responding when the results of a monitoring program indicate that an Action Level has been reached.

Response Plan - a part of the Response Framework that describes the specific actions to be taken by the Licensee in response to reaching or exceeding an Action Level.

Seepage – includes any Water or Waste that passes through or escapes from any structure designed to contain, withhold, divert, or retain the Water or Waste.

Sewage - includes all toilet Wastes and greywater.

Sewage Disposal Facilities - the ~~area and associated~~ Engineered Structures and areas designed to contain and treat Sewage.

Significance Threshold - a level of environmental change in any monitored parameter which, if reached, would result in significant adverse effects.

Solid Waste Disposal Facilities - the ~~area and associated~~ Engineered Structures and areas designed to contain solid Wastes.

Spill Contingency Plan - a document, developed in accordance with this Licence and Indian and Northern Affairs Canada’s 2007, or amended editions, *Guidelines for Spill Contingency Planning*, that clearly describes the activities required when a spill or Unauthorized Discharge occurs during the life of the Project.

Standard Proctor Dry Density - the maximum dry density at optimal moisture content as determined through compaction testing consistent with the American Society for Testing and Materials Standard D698.

Stinky Pond - the natural pond located adjacent to the east side of Tailings Pond 3.

Surveillance Network Program - the totality of the sampling requirements detailed in Annex A of this Licence.

Tailings - the material rejected from the mill after the recoverable valuable minerals have been extracted;

Tailings Containment Area – includes ~~comprises~~ the following Engineered Structures and areas designed to contain Tailings: Tailings Pond 1, Tailings Pond 2, Tailings Pond 3, Tailings Pond 4, and Tailings Pond 5 as depicted in the Water Licence Application and attachments dated February 6, 2008.

Traditional Knowledge – the cumulative, collective body of knowledge, experience, and values built up by a group of people through generations of living in close contact with nature. It builds upon the historical experiences of a people and adapts to social, economic, environmental, spiritual, and political change.

Unauthorized Discharge - is a release or Discharge of any Water or Waste not authorized under this Licence.

Waste - any Waste as defined by section 1 of the Act.

Waste Rock - all unprocessed rock materials, except ore and Tailings, which are produced as a result of mining and milling operations.

Waste Disposal Facilities – all facilities designated for the disposal of Waste, and includes the Sewage Disposal Facilities, Wastewater Treatment Facilities, Solid Waste Disposal Facilities and Landfarm.

Waste Management Plan - a document, developed in accordance with this Licence and the Mackenzie Valley Land and Water Board's March 2011, or amended editions, *Guidelines for the Development of a Waste Management Plan*, that clearly describes the activities planned to manage and monitor Wastes during the life of the Project.

Waste Rock - all unprocessed rock materials, except ore and Tailings, which are produced as a result of mining and milling operations.

Wastewater - the Water that is generated by site activities or originates from the Project on-site that requires treatment or any other Water management activity.

Wastewater Treatment Facilities - the infrastructure and ~~area and~~ associated Engineered Structures and areas designed to treat liquid Waste from the Tailings Containment Area, and from the Dry Stack Tailings Processing and Storage Facilities, and then Discharge the treated liquid Waste to Stinky Pond.

Water(s) - any Water as defined by section 1 of the Act.

Water Supply Facility - the intake infrastructure and associated area to collect and supply Water for the undertaking Project.

Water Content - with respect to soils, means the ratio of the volume of water to the total volume of the soil, including air, in a given soil mass.

Water Use - a use of Water as defined section 1 of the Act.

Water Use Fee - a fee for the use of Water set out in the Regulations promulgated under section 63 of the Act and the Board's March 2013, or amended editions, *Water Use Fee Policy*.

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Part B: General Conditions

1. The Licensee shall ensure a copy of this Licence is maintained on site at all times.
2. The **Water Use Fee** shall be paid by the Licensee annually, in advance of any Water Use, ~~in accordance with the Mackenzie Valley Land and Water Board's March 2013, or amended editions, Water Use Fee Policy.~~
3. ~~All references to policies, guidelines, codes of practice, statutes, regulations or other authorities shall be read as a reference to the most recent versions, unless otherwise denoted.~~
4. All information submitted to the Board, as required by this Licence, shall:
 - a) Be submitted in a form acceptable to the Board;
 - b) Be in accordance with the Board's March 2012, or amended editions, Document Submission Standards; and,
 - c) Include a section within each submission which identifies wherein the pertinent requirements of this Licence are addressed.
5. ~~The Licensee shall operate in accordance with management plans and monitoring programs approved under Licence MV2002L2-0019 unless and until a new or updated plan or program has been approved by the Board.~~
- 3-6. The Licensee shall operate in accordance with management plans and monitoring programs approved pursuant to the conditions of this Licence and with any revisions to the plans and programs as may be made from time to time pursuant to the conditions of this Licence and as approved by the Board.
- 4-7. All revised management plans and monitoring programs shall be submitted to the Board, for approval, at least sixty (60) days, prior to implementing any proposed updates or changes in the approved plan or program and shall be accompanied by a brief summary of the changes made to the plan or program. Revised plans referred to in Part B, item 15 [Engagement Plan]; Part G, item 2 [Waste Management Plan]; Part G, item 3 [Water Management and Mine-site Erosion and Sediment Protection Plan]; Part G, item 4 [Flat River Erosion and Sediment Protection Plan]; Part G, item 10 [Tailings Containment Area Monitoring Plan]; Part G, item 13 [Research and Monitoring Plan for Dry Stack Tailings Storage Facility TSF4b]; Part G, item 14 [Tailings Processing and Storage Facilities Management and Monitoring Plan]; Part G, item 15 [Groundwater Pumping Contingency Plan]; Part G, item 17 [Tailings Containment Area and Dry Stack Tailings Storage Facilities Emergency Preparedness Plan]; Part G, item 19 [Flat River Hydrology Plan] and shall be presented in a format consistent with the Mackenzie Valley Land and Water Board's *Standard Outline for Management Plans*.
- 5-8. The Licensee shall comply with the Schedules, which are annexed to and form part of this Licence, and any changes to the Schedules as may be made from time to time by the Board.
- 6-9. The Licensee shall ~~implement~~ comply the **Surveillance Network Program**, which is annexed to and forms part of this Licence, and any changes to the Surveillance Network Program as may be made from time to time by the Board.
- 7-10. The Schedules, the Surveillance Network Program, and any compliance dates specified in this Licence may be changed at the discretion of the Board. If any ~~compliance~~ dates for the submission of a plan, report, or program falls on a weekend or holiday, the plan, report, or program shall be submitted on the following business day.

Commented [Staff4]: Old B.9

Commented [Staff5]: Old D. 4

Commented [Staff6]: Old B.3

Commented [Staff7]: Old B.4

Commented [Staff8]: Old B.5

Commented [Staff9]: Old B.6

~~8-11.~~ Meters, devices, or other such methods used for measuring the volumes of Water used and Waste Discharged shall be installed, operated, and maintained by the Licensee to the satisfaction of an Inspector.

Commented [Staff10]: Old B.7

~~9-12.~~ The Licensee shall maintain, to the satisfaction of an Inspector, the signs necessary to identify the stations of the Surveillance Network Program.

Commented [Staff11]: Old B.8

~~40-13.~~ The Licensee shall submit to the Board, no later than March 31 of the year following the calendar year reported, an **Annual Water Licence Report**. The Report shall be in accordance with Schedule 1, item 1.

Commented [Staff12]: Old B.2

Board staff have moved the sub-conditions from Old B.2 into Schedule 1, item 1 as is the current MVLWB practice.

14. Within TIME (time) following issuance of this Licence, the Licensee shall submit to the Board, for approval, an Engagement Plan.

Commented [Staff13]: Board staff request input from reviewers and NATCL regarding this timeline.

15. The Licensee shall act in accordance with the approved Engagement Plan referred to in Part B, item 14 and shall review the Plan annually and make any necessary revisions to reflect changes in operations, or as directed by the Board. Revised Plans shall be submitted to the Board, for approval, in accordance with Part B, item 7.

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Part C: Conditions Applying to Security Requirements

~~1. The Licensee shall post and maintain security deposits pursuant to section 35 of the Act and section 11 of the Regulations, totaling \$30,950,000, as follows:~~

Commented [Staff14]: Old C.1

Board staff have moved the conditions containing security amounts from the Schedule and into the body of the Licence based on recent recommendations for other mining Licences.

~~a) Within ninety (90) days of the effective date of this Licence, the Licensee shall post and maintain a security deposit of \$27,950,000;~~

~~b) A minimum of ninety (90) days prior to the construction of Tailings Storage Facility 4b and 7, the Licensee shall post and maintain an additional security deposit of \$1,100,000 to maintain a total security deposit of \$29,050,000; and,~~

~~c) A minimum of ninety (90) days prior to the construction of Tailings Storage Facility 6, the Licensee shall post and maintain an additional security deposit of \$1,900,000 to maintain a total security deposit of \$30,950,000;~~

~~The security deposit shall be maintained until such time as it is fully or in part refunded by the Minister pursuant to section 35 of the Act.~~

Commented [Staff15]: Old C.2.

Board staff propose to delete this condition as it is inherent to the MVRMA.

~~2. Upon request of the Board, the Licensee shall submit an updated Project reclamation liability estimate utilizing the current version of RECLAIM or another method acceptable to the Board.~~

~~3. The amount of the security deposit required by Part C, item 1 may be revised by the Board based on estimates of the Project's reclamation liability referred to in Part C, item 2 or based on such other information as may become available to the Board. Security shall be sufficient to address the full current liability on the site.~~

Commented [Staff16]: Old C.3

~~A failure to provide the required security as set out will be cause for the Board to initiate proceedings to suspend the Licence.~~

Commented [Staff17]: Old C.4

Board staff propose to delete this condition as it is inherent to the MVRMA.

~~4.4. If the amount of the security deposit is revised by the Board as described under Part C, item 32, the Licensee shall post the revised amount with the Minister within ninety (90) days of the Board giving notice of the revised amount.~~

Commented [Staff18]: Old C.5

Part D: Conditions Applying to Water Use

1. ~~The Licensee shall obtain all Water for mining, milling, domestic and associated to be used uses~~ from the Flat River through the Water Supply Facility, or as otherwise approved by the Board.
2. The weekly quantity of Water withdrawn using the Water Supply Facility shall not exceed ~~forty-~~~~five~~~~thirty~~ thousand (3045,000) cubic metres (m³).
3. ~~The Licensee shall equip and maintain the fresh Water intake pumps with a screen designed to prevent the impingement and/or entrainment of fish. The screen shall be in accordance with the detailed guidance referred to in Schedule 2, item 1. have with~~ a mesh size sufficient to ensure no entrainment of fish, as outlined in Fisheries and Oceans Canada's 2005 *Freshwater Intake End-of-Pipe Fish Screen Guidelines (2005)* or subsequent approved editions.

~~Measurements of Water volumes withdrawn from the Flat River complete with pump specifications shall be maintained on-site and submitted to the Board for review annually with the Water Use Fees.~~

~~The Water Use Fee shall be paid annually, in advance of any Water Use.~~

Commented [Staff19]: Old D.1

Commented [Staff20]: Old D.2

Commented [Staff21]: Old D.3

Commented [Staff22]: Included in Part B, Annual Water Licence Report (Schedule)

Commented [Staff23]: Old D4, moved to Part B, item 2

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Part E: Conditions Applying to Construction

1. ~~The Licensee shall ensure that all structures intended to contain, withhold, divert, or retain Water or Wastes are designed, constructed, and maintained to minimize the escape Waste to the Receiving Environment.~~
2. ~~The Licensee shall ensure that all Engineered Structures intended to contain, withhold, divert, or retain Water or Wastes and which meet the definition of a dam under the *Dam Safety Guidelines* are designed, constructed, and maintained to meet or exceed the *Dam Safety Guidelines*.~~
3. ~~The Licensee shall ensure that all Engineered Structures are constructed and maintained following the recommendations of the Professional Engineer responsible for the design, including but not limited to, recommendations regarding field supervision and inspection requirements.~~
4. ~~The Licensee shall maintain construction records and geochemical records of construction materials for all Engineered Structures and make them available at the request of the Board or an Inspector.~~
5. ~~The Licensee shall submit a revised schedule for construction and mine-Project development upon request from the Board.~~

Commented [Staff24]: Board staff request recommendations regarding these new standard conditions and their enforceability given that the existing tailings ponds were designed to exfiltrate. Recommendations should also extend to consider future dry stack facilities.

Final Detailed Construction Plans and As-Built Reports

- ~~4-6.~~ A minimum of sixty (60) days prior to the commencement of construction of any new Landfarm, the Licensee shall submit to the Board, for approval, a **Final Detailed Construction Plan - Landfarm**, in accordance with Schedule 2, item 1.
- ~~2-7.~~ A minimum of sixty (60) days prior to the commencement of construction of any new Solid Waste Disposal Facility, the Licensee shall submit to the Board, for approval, a **Final Detailed Construction Plan - Solid Waste Disposal Facility**, in accordance with Schedule 2, item 2.
8. ~~The Licensee shall submit to the Board by December 31, 2014, for approval, a **Tailings Containment Area Cover Design Study** prepared by a Professional Engineer. The Study shall satisfy the requirements of Schedule 2, item 3.~~
- ~~3-9.~~ A minimum of ninety (90) days prior to the commencement of construction of the Dry Stack Tailings Storage Facilities TSF4b and TSF7, and a minimum of six (6) months prior to the commencement of construction of Dry Stack Tailings Storage Facility TSF6, the Licensee shall submit to the Board, for approval, the **Final Detailed Construction Plan** for each facility, in accordance with Schedule 2, item 4. Construction may be carried out only with written approval from the Board.
- ~~4-10.~~ A minimum of ninety (90) days prior to the commencement of the installation of a cover on the Dry Stack Tailings Storage Facilities TSF4b and TSF7, the Licensee shall submit to the Board, for approval, a **Final Detailed Cover Design Plan** for each facility, in accordance with Schedule 2, item 5. Construction may be carried out only with written approval from the Board.
- ~~5-11.~~ A minimum of six (6) months prior to the commencement of the installation of a cover on Dry Stack Tailings Storage Facility TSF6, the Licensee shall submit to the Board, for approval, a **Final Detailed Cover Design Plan – TSF6**, in accordance with Schedule 2, item 6. Construction may be carried out only with written approval from the Board.

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12. A minimum of sixty (60) days prior to the commencement of construction of any Engineered Structures intended to contain, withhold, divert, or retain Water or Waste not referred to in Part E, items 6 through 11, the Licensee shall submit to the Board, the Final Detailed Construction Plans. The Plans shall include design drawings and specifications and a Quality Control Plan stamped by a Professional Engineer. The Licensee shall ensure that these Engineered Structures are constructed in accordance with the Final Detailed Construction Plans.

~~6-13.~~ The Licensee shall ensure that the Engineered Structures identified in Part E, items 6 through 11, are constructed in accordance with the approved Final Detailed Construction Plans and the Final Detailed Cover Design Plans.

Commented [Staff31]: Encompasses Old E.30

~~7-14.~~ A minimum of ten (10) days prior to the commencement of construction of the Engineered Structures identified in Part E, items 6 through 11, the Licensee shall provide written notification to the Board and an Inspector. Notification shall include the name and contact information for the site manager.

Commented [Staff32]: Encompasses Old E. 31

~~8-15.~~ Within ninety (90) days of the completion of the construction of the Engineered Structures identified in Part E, items 6 through 11, the Licensee shall submit to the Board **As-Built Reports** which shall include as-built drawings of the structures, documentation of field decisions that deviate from the Final Detailed Construction Plans and the Final Detailed Cover Design Plan, and any data used to support these decisions.

Commented [Staff33]: Encompasses Old E.32

Monitoring Wells

~~11.~~ The Licensee shall drill, construct, and install 2" conventional ~~groundwater~~ Groundwater wells as follows:

- ~~a)~~ A minimum of two (2) additional ~~groundwater~~ Groundwater wells southeast of Tailings Pond 5;
- ~~b)~~ A minimum of one (1) additional ~~groundwater~~ Groundwater well upstream of the mine site;
- ~~c)~~ A minimum of one (1) additional ~~groundwater~~ Groundwater well east of Tailings Ponds 1 and 2;
- ~~d)~~ Prior to drilling, the locations and depths of the wells required by Part E, item 14(a-c) shall be determined by a Professional Engineer or Professional Geoscientist, in consultation with an Inspector;
- ~~e)~~ Drilling shall be complete by June 1, 2009; and,
- ~~f)~~ Within sixty (60) days of completing the drilling and installation of the ~~groundwater~~ Groundwater wells referred to in Part E, item 14(a-c), the Licensee shall submit to the Board, the **Drill Logs and Groundwater Well Construction Details**, including global positioning system coordinates for each well.

Commented [Staff34]: Old E.10 to 14

Board staff understands that this work has been completed and is requesting recommendations from reviewers regarding the removal of this entire condition.

Part F: Conditions Applying to Modifications

Commented [Staff35]: Old G (1) through (3)

1. The Licensee may, without written approval from the Board, carry out Modifications to the existing or planned physical works, provided the following requirements are met:
 - a) The Licensee has notified the Board and an Inspector in writing of such proposed Modifications at least sixty (60) days prior to the beginning of the Modifications;
 - b) The Modifications do not place the Licensee in contravention of either the Licence or the Act;
 - c) The Board has not, during the sixty (60) days following notification of the proposed Modifications, informed the Licensee that review of the proposal will require more than sixty (60) days;
 - d) An Inspector has authorized the proposed Modifications and provided a letter of notification to the Board; and,
 - e) The Board has not rejected the proposed Modifications.
2. Modifications for which all of the conditions referred to in Part F, item 1 have not been met, may be carried out only with written approval from the Board.
3. Within ninety (90) days of completion of the Modifications referred to in Part F, item 1, the Licensee shall provide as-built drawings stamped by a Professional Engineer to the Board.

DRAFT

Part G: Conditions Applying to Waste and Water Management

1. The Licensee shall manage Water and Waste with the objectives of minimizing the impacts of the Project on the quantity and quality of Water in the Receiving Environment through the use of appropriate mitigation measures, monitoring, and follow-up actions.

Management Plans and Monitoring Programs

- 4.2. The Licensee shall submit to the Board by January 31, 2013, for approval, a **Waste Management Plan**. The Plan shall be in accordance with the Mackenzie Valley Land and Water Board's March 2011, or amended editions, *Guidelines for Developing a Waste Management Plan*.
- 2.3. A minimum of ninety (90) days prior to the commencement of construction of any new Dry Stack Tailings Storage Facility, the Licensee shall submit to the Board, for approval, a **Water Management and Mine-site Erosion and Sediment Protection Plan**. The Plan shall provide details of the operating procedures for the handling, management and disposal of Water that comes into contact with the ~~Project mine facilities and activities~~ to meet the objectives listed in Part G, item 1, and satisfy the requirements of Schedule 3, item 1.
- 3.4. A minimum of ninety (90) days prior to the commencement of construction of Dry Stack Tailings Storage Facility TSF6, the Licensee shall submit to the Board, for approval, a **Flat River Erosion and Sediment Protection Plan** prepared by a Professional Engineer. The Plan shall meet the applicable *Dam Safety Guidelines* information requirements and shall satisfy the requirements of Schedule 3, item 2.
- 4.5. The Licensee shall submit to the Board by January 31, 2016, for approval, an updated **Hydrogeological Groundwater Study Report**. The Report shall satisfy the requirements of Schedule 3, item 3.
- 5.6. The Licensee shall submit to the Board by May 31, 2014, for approval, a **Geochemical Risk Assessment Report**. The Report shall detail the activities planned to assess the long-term geochemical risks at ~~the Cantung Project mine to meet the objectives listed in Part G, item 1, and satisfy the requirements of Schedule 3, item 4.~~
- 6.7. The Licensee shall submit to the Board by March 31, 2014, for approval, a **Geochemical Load Balance Model** prepared by a Professional Engineer or Professional Geoscientist using the data from the approved studies referred to in Part G, item 5 [Hydrogeological Groundwater Study Report] and Part G, item 6 [Geochemical Risk Assessment Report]. This Model shall include an analysis as to how it contributes to and is incorporated within the closure and reclamation plans referred to in Part J of this Licence.
- 7.8. The Licensee shall submit to the Board by June 1, 2015, for approval, an **Information Gap Analysis Report**. This Report shall identify outstanding information gaps regarding hydrogeological and geochemical conditions at the ~~Project mine~~, and shall outline recommended actions and timelines for addressing the identified gaps.
- 8.9. The Licensee shall submit to the Board by January 31, 2016, for approval, an **Integrated Geochemical Load Balance and Risk Assessment Report**. The Report shall satisfy the requirements of Schedule 3, item 5.
- 9.10. The Licensee shall submit to the Board by May 31, 2011, for approval, a **Tailings Containment Area Monitoring Plan**. The Plan shall satisfy the requirements of Schedule 3, item 6.

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40-11. The Licensee shall submit to the Board by March 31st each year, for approval, a **Tailings Storage Facility Cover Design Progress Report**, until the Final Detailed Cover Design Plan- ~~referred to as the Final Detailed Cover Design Plan~~ ~~is approved by the Board as per to in~~ Part E, item 11 of this Licence ~~is approved by the Board~~.

Commented [Staff45]: Old F.13

44-12. The Licensee shall submit to the Board by February 29, 2012, a **Historical Data and Interpretation Report of the Cantung Mine Site**. The Report shall satisfy the requirements of Schedule 3, item 7.

Commented [Staff46]: Old F.16

42-13. The Licensee shall submit to the Board by June 1, 2015, for approval, a **Research and Monitoring Plan for Dry Stack Tailings Storage Facility TSF4b**. This Plan shall describe how the Licensee plans to collect information from TSF4b in support of the development of the Final Detailed Construction Plans and Final Detailed Cover Design Plans for the Dry Stack Tailings Storage Facilities as referred to in Part E of this Licence.

Commented [Staff47]: Old F.12

43-14. A minimum of ninety (90) days prior to the operation of the Dry Stack Tailings Processing Facility and to the construction of TSF4b and TSF7, and a minimum of six (6) months prior to the construction of TSF6, the Licensee shall submit to the Board, for approval, a **Tailings Processing and Storage Facilities Management and Monitoring Plan**, ~~—TSF4b and TSF7—~~ which shall satisfy the requirements of Schedule 3, item 8.

Commented [Staff48]: Old F.14

44-15. The Licensee shall submit to the Board, by December 31, 2012, and then within six (6) months of the submission referred to in Part G, item 5 [Hydrogeological Groundwater Study Report], for approval, a **Groundwater Pumping Contingency Plan** updated to current site conditions. ~~The Plan shall~~ satisfy the requirements of Schedule 3, item 9.

Commented [Staff49]: Old F.15

17. A minimum of ninety (90) days prior to the construction of any new Dry Stack Tailings Storage Facility, the Licensee shall submit to the Board, for approval, a **Tailings Containment Area and Dry Stack Tailings Storage Facilities Emergency Preparedness Plan**, prepared by signed and stamped by a Professional Engineer. Where applicable, the Plan shall ~~conform to~~ be in accordance with the Section 4 of the *Dam Safety Guidelines*.

Commented [Staff50]: Old F.17

18. The Licensee shall submit to the Board by January 31, 2013, for approval, a **Wastewater Treatment Facilities Operations, Maintenance and Surveillance Manual**.

Commented [Staff51]: Old F.18

19. Prior to initiating ~~ed~~ discharge from the Wastewater Treatment Facilities at a rate greater than 4,500 m³/day, the Licensee shall submit to the Board, for approval, a **Flat River Hydrology Plan**. The Plan shall be in accordance with Schedule 3, item 10.

Commented [Staff52]: Old F.24

20. The Licensee shall complete and submit by January 31, 2013 for approval by the Board, a **Plume Delineation Study Design** for the effluent discharged from the Wastewater Treatment Facilities.

Commented [Staff53]: Old F.22

21. The Licensee shall complete and submit to the Board within ninety (90) days of completion of the study, for approval, a **Plume Delineation Study Report** in accordance with the approved Plume Delineation Study Design required under Part G, item 20.

Commented [Staff54]: Old F.23

22. Within six (6) months following the initial high Discharge period under the conditions specified in Part G, item 36. The Licensee shall submit to the Board, for approval, an S4-44 Evaluation Report for nitrite, fluoride, and selenium. The Report shall include, but not be limited to, the following information:

Commented [Staff55]: Old F.25

a) An assessment of whether the ~~current~~ Water quality objectives for these parameters are being met at SNPSurveillance Network Program station 4-44;

- b) Recommendations and supporting rationale for revising or maintaining the established Water quality objectives for each of these parameters; and,
- c) Details on potential mitigation measures for these parameters if the recommended Water quality objectives cannot be met.

23. The Licensee shall submit to the Board by January 31, 2017, for approval, a **Nitrogen Response Plan**. This Plan shall satisfy the requirements listed in Schedule 3, item 11.

~~22-24.~~ A minimum of six(6) months prior to applying for a closure Water licence as per Part H, item x, ~~the~~ Licensee shall complete and submit to the Board ~~by February 16, 2009,~~ for approval, an updated Phase II Environmental Site Assessment Report for the undertaking Project that satisfies the requirements of a Canadian Standards Association (Z769) Phase II Environmental Site Assessment and includes an analysis, conducted by a Professional Engineer or Professional Geoscientist, as to how the Phase II Environmental Site Assessment contributes to and is incorporated with the closure and reclamation plans referred to in Part J of this Licence.

Commented [Staff56]: Old F.19

Board staff have updated the timeline for this condition to reflect the Board's direction in its August 18, 2011 letter. Board staff are seeking input regarding whether the proposed revision to the timeline is reasonable.

~~23-25.~~ The Licensee shall complete and submit to the Board ~~by xxxxMarch 31, 2009,~~ for approval, a Qualitative and Quantitative Ecological Risk Assessment Report for the Flat River Tailings that satisfies the requirements of the Canadian Council of Ministers of the Environment's "Framework for Ecological Risk Assessment" and includes an analysis, conducted by a Professional Engineer or Professional Geoscientist, as to how the Assessment contributes to and is incorporated with the closure and reclamation plans referred to in Part J of this Licence.

Commented [Staff57]: Old F.20

Board staff notes that the Board has not yet made a determination regarding the risk assessment approach for the Flat River tailings. Board staff are requesting recommendations regarding the timeline for an updated ecological risk assessment should the Board determine that an updated assessment must be submitted separately (rather than being incorporated into the closure and reclamation planning process).

~~24.~~ ~~Based on the approved Report required by Part F, Item 17, the Licensee shall complete and submit to the Board, by December 1, 2011, for approval, a **Detailed Quantitative Ecological Risk Assessment Report for the Flat River Tailings** that fulfills the requirements of the Canadian Council of Ministers of the Environment's "Framework for Ecological Risk Assessment" and includes an analysis by a Professional Engineer or Professional Geoscientist as to how the Quantitative Risk Assessment Report contributes to and is incorporated with the closure and reclamation plans referred to in Part J of this Licence.~~

Commented [Staff58]: Old F.21

~~25-26.~~ The Licensee shall act in accordance with the approved Plans referred to in Part G, item 2 [Waste Management Plan]; Part G, item 3 [Water Management and Mine-site Erosion and Sediment Protection Plan]; Part G, item 4 [Flat River Erosion and Sediment Protection Plan]; Part G, item 10 [Tailings Containment Area Monitoring Plan]; Part G, item 13 [Research and Monitoring Plan for Dry Stack Tailings Storage Facility TSF4b]; Part G, item 14 [Tailings Processing and Storage Facilities Management and Monitoring Plan]; Part G, item 15 [Groundwater Pumping Contingency Plan]; Part G, item 17 [Tailings Containment Area and Dry Stack Tailings Storage Facilities Emergency Preparedness Plan]; and Part G, item 19 [Flat River Hydrology Plan] and shall review the Plan annually and make any necessary revisions to reflect changes in operations, or as directed by the Board. Revised Plans shall be submitted to the Board, for approval, in accordance with Part B, item 7 of this Licence.

Commented [Staff59]: Old F.26 and F27 combined

Operations of Structures and Facilities

~~26-27.~~ The Licensee shall construct, operate, and maintain the Dry Stack Tailings Storage Facilities to design specifications/engineering standards, such that:

Commented [Staff60]: Old E.27 (a-m)

- a) The Dry Stack Tailings Storage Facilities and covers are geotechnically stable;
- b) The potential for liquefaction within and beneath the Dry Stack Tailings Storage Facilities is minimized in the event of the design basis earthquake event for operations and the maximum design earthquake at closure;
- c) All Tailings deposited in the Dry Stack Tailings Storage Facilities are compacted to a minimum of 95% Standard Proctor Dry Density, or as otherwise directed by the design Professional

- Engineer when it is not possible or practical to meet this density. Areas of reduced compaction density must be minimized;
- d) Run-on Water entering the Dry Stack Tailings Storage Facilities from up-gradient sources of surface Water is minimized;
 - e) Surface Water interception and diversion structures are constructed to manage peak Discharge from 1/1000-year storm event;
 - i) Interactions between the Dry Stack Tailings Storage Facilities and the Flat River are minimized for the 1/1000-year flood event;
 - f) Any changes in the phreatic Water surface level shall not interfere with the geotechnical stability of the Dry Stack Tailings Storage Facilities;
 - g) Infiltration of Water during routine operations is minimized;
 - h) Generation of wind-blown dust from the Dry Stack Tailings Storage Facilities is minimized;
 - i) Signs of erosion or settlement are addressed immediately;
 - j) Conditions for eventual closure and reclamation of the Dry Stack Tailings Storage Facilities are optimized;
 - k) The maximum open area in Dry Stack Tailings Storage Facility 6 is sixteen (16) hectares at any given time; and,
 - l) Monitoring of the Dry Stack Tailings Storage Facilities is sufficient to ensure that:
 - i. Performance design criteria, as described in the Final Detailed Construction Plans referred to in Part E, item 8 and the Final Detailed Cover Design Plans referred to in Part E, items 10 and 11, are being met; and,
 - ii. Necessary changes in operation of the Dry Stack Tailings Storage Facilities, including any additional mitigations, are identified.

Inspections of Structures and Facilities

28. The Licensee shall conduct daily inspections of the dams, Tailings line(s) and catchment basin(s) during milling operations, and daily inspections of the Wastewater Treatment Facilities, Stinky Pond, the drainage culvert, and the channel to the Flat River when the Wastewater Treatment Facilities are operational, or more frequently as directed by an Inspector. Records of these inspections shall be made available to an Inspector or the Board upon request.

Commented [Staff61]: Old E(9)(c) and (d)

27-29. The Licensee shall ensure that geotechnical inspections of the Tailings Containment Area and Dry Stack Tailings Storage Facilities are conducted annually, during the summer months, by a Professional Engineer and following any unforeseen extreme events (such as earthquakes, flooding, cracks, sinkhole formation, etc) by a Professional Engineer. The Licensee shall:

Commented [Staff62]: Old Part E, item 9(f) and Part E, item 27(n)

- a) Provide written notification to an Inspector a minimum of two (2) weeks prior to the Professional Engineer's annual inspections; and,
- b) Within sixty (60) days of completing the inspection, the Licensee shall submit the Professional Engineer's full **Geotechnical Inspection Report** to the Board. The Report shall include a covering letter from the Licensee outlining an implementation plan to respond to any recommendations made by the Professional Engineer, including a rationale for any decisions that deviate from the Professional Engineer's recommendations and a summary of any actions taken by the Licensee to satisfy the previous review's engineering recommendations.

28-30. The Licensee shall conduct an independent **Dam Safety Review** of the Tailings Containment Area prior to October 1, 2012, and every five (5) years thereafter, or at a frequency approved by the Board. The Dam Safety Review shall be conducted in accordance with the *Dam Safety Guidelines* by a Professional Engineer. The timing of the Dam Safety Review shall be at the discretion of the Professional Engineer conducting the inspection. Within ninety (90) days of completing the Dam Safety Review, the Licensee shall submit the Professional Engineer's **Dam**

Commented [Staff63]: Old E(9)(e)

Safety Review Report to the Board. The Report shall include a covering letter from the Licensee outlining an implementation plan to respond to any recommendations made by the Professional Engineer, including a rationale for any decisions that deviate from the Professional Engineer's recommendations, and a summary of any actions taken by the Licensee to satisfy the Professional Engineer's recommendations from the previous Review.

~~29-31.~~ The Licensee shall conduct an independent inspection and review of the Dry Stack Tailings Storage Facilities every five (5) years following the commencement of their construction, or at a frequency approved by the Board. The **Dry Stack Tailings Storage Facilities Inspection and Review** shall be conducted by a Professional Engineer, and where applicable a Professional Geoscientist, and may be conducted during the year at the Professional Engineer's discretion. Within ninety (90) days of completing the Dry Stack Tailings Storage Facilities Review and Inspection, the Licensee shall submit the Professional Engineer's, and where applicable Professional Geoscientist's, Dry Stack Tailings Storage Facilities Inspection and Review Report to the Board. The Report shall include a covering letter from the Licensee outlining an implementation plan to respond to any recommendation made by the Professional Engineer, including a rationale for any decisions that deviate from the Professional Engineer's recommendations, and a summary of any actions taken by the Licensee to satisfy the Professional Engineer's recommendations from the previous Review.

Commented [Staff64]: Old E.27(o)

Discharge Locations and Rates

~~30-32.~~ The Licensee shall direct all Tailings to the Tailings Containment Area, the Dry Stack Tailings Storage Facilities, or underground, as described in the approved Tailings Processing and Storage Facilities Management and Monitoring Plan referred to in Part G, Item 14.

Commented [Staff65]: Old E.1

~~34-33.~~ The Licensee shall direct all Sewage to the Tailings Containment Area.

Commented [Staff66]: Old E.2

~~34.~~ The Licensee shall direct all liquid Waste from the Wastewater Treatment Facilities to Stinky Pond or to the Tailings Containment Area.

Commented [Staff67]: Old E.3

~~32-35.~~ The Licensee shall ensure that a control structure is installed and maintained at the culvert at the outlet of Stinky Pond, such that the flow of Waste from Stinky Pond can be stopped and directed back to the Tailings Containment Area. The Licensee shall only seal the culvert if directed to do so by an Inspector.

~~33-36.~~ The Licensee shall ~~Discharge~~ effluent from the Wastewater Treatment Facilities to Stinky Pond at the following rates:

Commented [Staff68]: Old E.4, 5, 6, 7 combined.

- a) When the flow rate of the Flat River is less than 50,000 m³/day, the maximum ~~Discharge~~ rate should not exceed 187.5 m³/hr, to a maximum ~~Discharge~~ of 4,500 m³/day;
- b) When the flow rate of the Flat River is greater than or equal to 50,000 m³/day, the maximum ~~Discharge~~ rate should not exceed 333.3 m³/hr, to a maximum ~~Discharge~~ of 8,000 m³/day;
- c) The maximum hourly ~~Discharge~~ rate specified in Part G, item 36(a) may be increased to a maximum rate of 333.3m³/hr, when:
 - i. The Flat River flow rate exceeds 50,000 m³/day for three (3) consecutive days, as verified by methods outlined in the approved Hydrology Plan;
 - ii. Ice-off conditions are present at ~~SNP-Surveillance Network Program~~ station 4-45 as verified by methods outlined in the approved Hydrology Plan;
 - iii. An Inspector has provided written authorization for an increased ~~Discharge~~ rate; and,
- d) The increased maximum hourly ~~Discharge~~ rate referred to in Part G, item 36(c) must immediately revert to that specified in Part G, item 36(a) when the flow rate of the Flat River is

less than 50,000 m³/day for three (3) consecutive days or when ice-on conditions are observed at the Surveillance Network Program SNP station 4-45).

34-37. During transition periods between the Discharge rates outlined in Part G, item 36, the Licensee shall record and report the daily Discharge volume of the Flat River to the Board and to the Inspector as described in the approved Flat River Hydrology Plan required under Part G, item 19.

Commented [Staff69]: Old E.6

Effluent Quality Criteria

35-38. The Licensee shall ensure that effluent from the Wastewater Treatment Facilities at Surveillance Network Program station 4-43 has a pH value between 6.5 and 9.0 and meets the following effluent quality criteria (EQC):

Commented [Staff70]: Old E.16 and E.17

Parameter	EQC in mg/L	
	Maximum Average Concentration	Maximum Grab Concentration
Total Suspended Solids	12	24
Ammonia*	5	10
Fluoride		
Nitrate	8	16
Sulphate	384	768
Aluminum*	1	2
Arsenic*	0.02	0.04
Boron*	4	8
Cadmium*	0.0007	0.001
Chromium*	0.0008	0.002
Copper*	0.01	0.02
Iron*	0.8	1.5
Lead*	0.02	0.04
Molybdenum*	0.3	0.6
Nickel*		
Zinc*	0.1	0.2

Commented [Staff71]: To be determined by the Board.

(*) Measured in total concentrations.

36-39. The Licensee shall direct effluent from the Wastewater Treatment Facilities which does not meet the effluent quality criteria specified in Part G, item 38 back to the Tailings Containment Area.

Commented [Staff72]: Old E.18

37-40. The Licensee shall submit to the Board and an Inspector, the Water quality data from samples collected from Surveillance Network Program station 4-43 [Wastewater Treatment Facility] as follows:

Commented [Staff73]: Old E.19

- No later than five (5) days prior to commencing the initial Discharge of effluent to Stinky Pond; and,
- Following a sampling event that exceeds the EQC specified Part G, item 38, prior to resuming Discharge to Stinky Pond.

38-41. The Licensee shall obtain written authorization from an Inspector te-prior to commencing the initial Discharge from the Wastewater Treatment Facilities to Stinky Pond and-teor resuming Discharge following a non-compliant sampling event referred to in Part G, item 40.

Commented [Staff74]: Old E.20

39-42. The Licensee shall ensure that Seepage downgradient of the fuel berm at Surveillance Network Program station 4-34 meets the following effluent quality criteria:

Commented [Staff75]: Old E.21

Parameter	EQC in mg/L	
	Maximum Average Concentration	Maximum Grab Concentration
Extractable Petroleum Hydrocarbons	4.00	5.00
Benzene	4.00	-
Ethyl Benzene	2.00	-
Toluene	0.39	-

43. If any EQCs as listed in Part G, item 42 are exceeded, the Licensee shall act in accordance with the approved Spill Contingency Plan referred to in Part I of this Licence.

40-44. The Licensee shall ensure that ~~groundwater~~Groundwater sampled at Surveillance Network Program stations 4-27-4, 4-27-7 to 4-27-16 (inclusive), 4-28-1 and 4-28-2 has a pH value between 6.0 and 9.0 and meets the following effluent quality criteria:

Commented [Staff76]: Old E.22 and 23

Parameter	EQC in mg/L	
	Maximum Average Concentration	Maximum Grab Concentration
Total Suspended Solids	15.0	30.0
Ammonia as NH ₃ *	5.00	10.00
Arsenic*	0.20	0.40
Cadmium*	0.01	0.02
Copper*	0.20	0.40
Lead*	0.20	0.40
Nickel*	0.40	0.80
Zinc*	0.20	0.40

(*) Measured in total concentrations.

44-45. If Water quality data from any ~~groundwater~~Groundwater sample collected at Surveillance Network Program stations 4-27-4, 4-27-7 to 4-27-16 (inclusive), 4-28-1 and 4-28-2 exceeds the EQC specified in Part G, item 42, the Licensee shall:

Commented [Staff77]: Old E.24

- a) Implement the Groundwater Pumping Contingency Plan referred to in Part G, item 15 of this Licence;
- b) Notify an Inspector immediately; and,
- c) Within thirty (30) days following implementation of the Groundwater Pumping Contingency Plan, report the occurrence to the Board and an Inspector, which shall include a description of actions taken to prevent ~~groundwater~~Groundwater that exceeds the effluent quality criteria from reaching the Flat River.

Part H: Conditions Applying to Aquatic Effects Monitoring

Commented [Staff78]: Part H is an entirely new portion of the draft Licence.

1. The Licensee shall design and implement an Aquatic Effects Monitoring Program (AEMP) that meets the following objectives:
 - a) To determine the short- and long-term effects of the Project on the Receiving Environment;
 - b) To test the predictions made in submissions to the Board regarding the impacts of the Project on the Receiving Environment;
 - a) To assess the effectiveness of mitigation measures that are used to minimize the effects of the Project on the Receiving Environment;
 - b) To identify whether there is any need for additional mitigation measures to reduce or eliminate Project -related effects; and,
 - c) To provide an early warning system where the results of aquatic monitoring are used to prevent or avoid adverse environmental effects through a Response Framework and regular evaluation of the AEMP.
2. The Licensee shall submit to the Board by March 31, 2016, for approval, an **AEMP Design Plan**. The Plan shall satisfy the requirements of Schedule 4, item 1.
3. The Licensee shall implement the AEMP Design Plan referred to in Part H, item 2 once approved, and may at any time propose revisions to the Plan. The Licensee shall review and revise the Plan as necessary to reflect directives from the Board. All revised Plans shall be submitted to the Board for approval.
4. The Licensee shall submit to the Board, for approval, a revised AEMP Design Plan every three (3) years following the previous approval, or as directed by the Board.
5. The Licensee shall submit to the Board by May 1, 2019 or as directed by the Board, for approval, an **Aquatic Effects Re-evaluation Report**, and every three (3) years thereafter, that meets the following objectives and satisfies the requirements of Schedule 4, item 2:
 - a) To describe the Project-related effects on the Receiving Environment as measured from Project inception and compared against predictions;
 - b) To revise predictions of Project-related effects on the Receiving Environment based on monitoring results obtained since Project inception; and,
 - c) To provide supporting evidence, if necessary, for proposed revisions to the AEMP Design Plan.
6. The Licensee shall submit to the Board on or before **DATE** each year, for approval, an **AEMP Annual Report**. The Report shall satisfy the requirements of Schedule 4, item 3, and include information relating to data collected in the preceding calendar year.
7. If any Action Level as defined in the approved AEMP Design Plan is exceeded, the Licensee shall:
 - a) Notify the Board within thirty (30) days of when the exceedance is detected; and,
 - b) Within ninety (90) days of when the exceedance is detected, or as otherwise directed by the Board, submit to the Board, for approval, an **AEMP Response Plan** that satisfies the requirements of Schedule 4, item 4.
8. The Licensee shall submit a revised AEMP Response Plan as directed by the Board.
9. If not approved by the Board, the plans and reports referred to in Part I, items 2, 5, 6, and 7 shall be revised and resubmitted in accordance with directives from the Board.

Commented [Staff79]: Board staff request recommendations regarding this date.

Commented [Staff80]: Board staff request recommendations regarding this date

Part I: Conditions Applying to Contingency Planning

1. Within sixty (60) days following issuance of this Licence, the Licensee shall submit to the Board, for approval, a **Spill Contingency Plan**. The Licensee shall not commence construction or Drawdown until the Board has approved the Plan.
2. The Licensee shall act in accordance with the approved Spill Contingency Plan and shall annually review the Plan and make any necessary revisions to reflect changes in operations, technology, chemicals, or fuels; or as directed by the Board. The revised Plan shall include a brief summary of the changes made, and shall be submitted to the Board for approval at least sixty (60) days prior to any proposed changes to the requirements in the approved Plan.
- 4.3. If, during the period of this Licence, a spill or Unauthorized Discharge of Waste occurs or is foreseeable the Licensee shall:
 - a) Implement the Spill Contingency Plan;
 - b) Report the incident immediately via the 24 Hour Spill Reporting Line (867) 920-8130 in accordance with the instructions contained in the Spill Report Form NWT 1752/0593 ~~or subsequent editions;~~
 - c) Report each spill and Unauthorized Discharge to the Board and an Inspector within 24 hours;
 - d) Submit a detailed report on each spill and Unauthorized Discharge, including descriptions of root causes, response actions and any changes to procedures to prevent similar occurrences in the future, to the Board and an Inspector within thirty (30) days; and
 - e) Implement relevant components of the Groundwater Pumping Contingency Plan set out in Part G, item 15.
- 2.4. All spills and Unauthorized Discharges of Water or Waste shall be reclaimed to the satisfaction of an Inspector.

Commented [Staff81]: Old E.15

Part J: Conditions Applying to Closure and Reclamation

1. Within twenty four (24) months following issuance of this Licence, the Licensee shall submit to the Board, for approval, an **Interim Closure and Reclamation Plan**.
2. The Licensee shall submit to the Board, for approval, a revised Interim Closure and Reclamation Plan every three (3) years from the preceeding date of approval or upon the request of the Board.
3. The Licensee shall act in accordance with the Interim Closure and Reclamation Plan as approved by the Board, and shall endeavor to carry out Progressive Reclamation of areas as soon as is reasonably practicable.
- 3.4. The Licensee shall annually submit to the Board no later than March 31, an **Annual Closure and Reclamation Plan Progress Report**, which shall be in accordance with the Guidelines referred to in Part J, item 1 and any other information requested by the Board by November 1 of the previous calendar year.
- 4.5. A minimum of twenty four (24) months prior to the end of commercial operations, the Licensee shall submit a **Final Closure and Reclamation Plan** to the Board for approval.
- 5.6. A minimum of eighteen (18) months prior to start of final closure and reclamation, the Licensee shall apply to the Board for a new Licence specific to those activities.

Commented [Staff82]: Old H.1

Commented [Staff83]: Part of Old H.9

Commented [Staff84]: Part of Old H.9

Commented [Staff85]: Old H.10

Commented [Staff86]: Board staff request recommendations regarding the timing presented in these conditions.

Signed the XX day of XX, XXX on behalf of the Mackenzie Valley Land and Water Board

Schedules
Attached to Water Licence MV2015L2-0003
North American Tungsten Corporation Ltd. – Cantung Mine

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Schedule 1

Part B – Annual Water Licence Report

1. The **Annual Water Licence Report** referred to in Part B, item 13 of this Licence shall include, but not be limited to, the following information:

Commented [Staff87]: Board staff note that this section has been reorganized to follow the flow of the WL body.

Management Plans and Activities

- a) A summary of engagement activities conducted in accordance with the approved **Engagement Plan**, referred to in Part B of this Licence, undertaken during the previous calendar year, including a brief description of activities planned for the forthcoming year;
- a)b) A summary of **construction** and maintenance activities conducted in accordance with Part D of this Licence, undertaken during the previous calendar year;
- b)c) An updated Project mine plan;
- d) A summary of **Modification** activities conducted in accordance with Part E of this Licence, undertaken during the previous calendar year;
- e) A summary of activities conducted in accordance with the approved **Waste Management Plan** referred to in Part G of this Licence, undertaken during the previous calendar year, including a summary of updates or changes to the processes or facilities required for the management of Waste, including the following:
- i. Monthly and annual quantities in cubic meters (m³) of soil treated in the Landfarm;
 - ii. Monthly and annual quantities of solid Waste disposed of in the Solid Waste Disposal Facility;
 - iii. Monthly and annual quantities of hazardous Waste generated and removed from the Project mine site; and
 - iv. A summary of weekly Waste Rock composites, geochemical analysis, including acid base accounting analysis, sampling dates, and geologic rock types.
- f) A summary of activities conducted in accordance with the approved **Water Management and Mine-site Erosion and Sediment Protection Plan** referred to in Part G of this Licence, undertaken during the previous calendar year, including a summary of updates or changes to the process or facilities required for the management of Water or Wastewater, including the following:
- ~~v.i.~~ Monthly and annual quantities in cubic metres (m³) of Water pumped from the Flat River ~~Measurements of Water volumes withdrawn from the Flat River complete with pump specifications shall be maintained on-site and submitted to the Board for review annually with the Water Use Fees;~~
 - ~~vi.ii.~~ Monthly and annual quantities in cubic metres (m³) of liquid Waste pumped from each Dry Stack Tailings Storage Facility and directed to the Wastewater Treatment Facilities or the Tailings Containment Area, identified by facility;
 - ~~vii.iii.~~ Monthly and annual quantities in cubic metres (m³) of the solid and liquid fractions discharged to the Tailings Containment Area;
 - ~~viii.iv.~~ Weekly and annual quantities in cubic metres (m³) of liquid Waste discharged from the Wastewater Treatment Facilities to Stinky Pond;
 - ~~ix.v.~~ Monthly and annual quantities in cubic metres (m³) of liquid Waste discharged from Stinky Pond to the Flat River;
 - ~~x.vi.~~ Weekly and annual Flat River flow volume in cubic metres (m³);

- xi-vii. Monthly and annual quantities in cubic metres (m³) of Sewage discharged to the Tailings Containment Area;
- xii-viii. Monthly and annual quantities in cubic metres (m³) of recycled Minewater;
 - ix. Monthly and annual estimates and measurements of precipitation and runoff;
 - x. Monthly and annual quantities of Water in cubic metres (m³) used for dust control;
 - xi. A description of any erosion susceptible areas encountered and a summary of activities to prevent or mitigate erosion;
 - xii. A report of the performance of mitigations applied to each area;
 - xiii. A summary and interpretation of monitoring results, including any Action Level exceedances;
 - xiv. A description of actions taken in response to any Action Level exceedances; and
 - xv. An updated Water balance if required as per the approved **Plan**;
- g) A summary of activities conducted in accordance with the approved **Flat River Erosion and Sediment Protection Plan** referred to in Part G of this Licence, undertaken during the previous calendar year, including the following:
 - i. A description of any erosion susceptible areas encountered and a summary of activities to prevent or mitigate erosion; and
 - ii. A report of the performance of mitigations applied to each area;
- h) A summary of activities conducted in accordance with the approved **Tailings Processing and Storage Facilities Management and Monitoring Plan** referred to in Part G of this Licence, undertaken during the previous calendar year, including any Action Level exceedances and a description of actions taken in response to any Action Level exceedances:
 - i. Monthly, annual, and total quantities in cubic metres (m³) of solid Waste discharged to each of the Dry Stack Tailings Storage Facilities;
 - ii. The total size of each of the Dry Stack Tailings Storage Facilities, including the area of the covered portion(s), the area of the open portion(s), and the minimum and maximum heights;
 - iii. A summary of the moisture and density data gathered for each of the Dry Stack Tailings Storage Facilities; and
 - iv. A summary and interpretation of monitoring results, including any Action Level exceedances; and
 - v. A description of actions taken in response to Action Level exceedances;
- i) A summary of activities conducted in accordance with the following approved plans, undertaken during the previous calendar year, including any Action Level exceedances and a description of actions taken in response to any Action Level exceedances for the following plans in Part G of this Licence:
 - i. **Groundwater Pumping Contingency Plan**;
 - ii. **Tailings Containment Area and Dry Stack Tailings Storage Facilities Emergency Preparedness Plan**; and
 - iii. **Flat River Hydrology Plan**, including:
 - i. Daily, weekly, and annual flow data for the Middle Bridge station;
 - ii. The transition dates for high and low flow season Discharge from the Wastewater Treatment Facility;
 - iii. The number of days that the Wastewater Treatment Facility discharged at a rate greater than 4,500 m³/day;
 - iv. Dates and documentation of the ice-on and ice-off conditions;
 - v. Summaries of flows measured in the tributary streams;

- vi. Flow rates measures at the surface runoff Surveillance Network Program stations; and
- vii. An updated stage-discharge rating curve for the Surveillance Network Monitoring Stations S4-45 and S4-5;

e)j) A summary of actions taken in response to the various inspections conducted during the previous calendar year referred to in Part G of this Licence, including the following:

- i. **Geotechnical Inspection Report** for the geotechnical inspection(s);
- ii. **Dam Safety Review Report** when the Dam Safety Review was conducted;
- iii. **Dry Stack Tailings Storage Facilities Inspection and Review Report** for the Dry Stack Tailings Storage Facilities Inspection and Review; and,
- iv. the Inspections referred to in Part G, item 54 of this Licence;

k) A summary of activities conducted in accordance with the approved **Spill Contingency Plan**, required in Part I, item 1 of this Licence, undertaken during the previous calendar year, including the following:

- i. A list and description for all Unauthorized Discharges that occurred during the previous calendar year, including the date, NWT spill number, volume, location, summary of the circumstances and follow-up actions taken, and status (i.e. open or closed), in accordance with the reporting requirements in Part H, item 3 of this Licence;
- ii. An outline of any spill training and communications exercises carried out during the previous calendar year; and
- iii. A detailed discussion on the performance, installation, and evaluation, including the use of photographs, of the primary and secondary containment measures used in fuel storage to prevent impacts to all Waters;

l) A summary of activities conducted in accordance with the approved **Interim Closure and Reclamation Plan** referred to in Part J, item X of this Licence, undertaken during the previous calendar year, including the following:

- i. A progress report on any reclamation research programs undertaken during the year;
- ii. A summary of any Progressive Reclamation work undertaken during the year, supported by applicable environmental or analytical reports;
- iii. An evaluation of the previous year's reclamation work;
- iv. An outline of activities planned for the forthcoming calendar year; and
- v. Any adjustments or transactions made in regards to the security deposit;

Other Reporting Requirements

m) A progress report on **Aquatic Effects Monitoring Program Response Plans** referred to in Part H of this Licence, requested by the Board and undertaken during the previous calendar year, and a brief description of any future studies planned by the Licensee;

n) Any other details on Water Use or Waste disposal requested by the Board by November 1st of the year being reported;

o) A summary of the calibration and status of the meters and devices referred to in Part B, item 9 of this Licence;

e)p) Tabular summaries of all data and information generated during the previous calendar year under the Surveillance Network Program, and graphical summaries of parameters with effluent quality criteria referred to in Part G, at the points of compliance (Surveillance Network Program stations 4-27-4, 4-27-7 TO 4-27-16 (inclusive), 4-28-1 AND 4-28-2, 4-34 and 4-43), in excel or an electronic and printed format acceptable to the Board. The Licensee shall provide raw data in electronic form to the Board;

e)q) Discussion of any problems with data collection, analysis, or results;

r) A list of submissions made to the Board during the previous calendar year; and,

s) A summary of actions taken to address concerns, non-conformances, or deficiencies in any reports filed by an Inspector during the previous calendar year.

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~~Schedule 2~~

Commented [Staff88]: Moved to Part C – body of WL

~~Part C – Security Requirements~~

~~1. Pursuant to section 35 of the Act and section 11 of the Waters Regulations, the Licensee shall post security totaling \$30,950,000 based on the schedule set out below:~~

~~Within ninety (90) days of the effective date of this Licence, the Licensee shall post and maintain a security deposit of \$27,950,000;~~

~~A minimum of ninety (90) days prior to the construction of Tailings Storage Facility 4b and 7, the Licensee shall post and maintain an additional security deposit of \$1,100,000 to maintain a total security deposit of 29,050,000; and,~~

~~A minimum of ninety (90) days prior to the construction of Tailings Storage Facility 6, the Licensee shall post and maintain an additional security deposit of \$1,900,000 to maintain a total security deposit of 30,950,000;~~

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~~— Schedule 3 —~~

~~Part D – Water Use~~

~~1. The Licensee shall adhere to the best practices outlined in both the Department of Fisheries and Oceans' Freshwater Intake End-of-Pipe Fish Screen Guidelines, 1995, or amended editions, and Fish Screen Design Criteria for Flood and Water Truck Pumps, 2011, or amended editions.~~

Commented [Staff89]: Moved to Part D – in body of WL

~~2.1. Measurements of Water volumes withdrawn from the Flat River complete with pump specifications shall be maintained on-site and submitted to the Board for review annually with the Water Use Fees.~~

Commented [Staff90]: Included in Part B, Annual Water Licence Report

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Schedule 2

Part E – Construction

1. The **Final Detailed Construction Plan - Landfarm** referred to in Part E, item 6 of this Licence, shall include, but not be limited to, the following information:
 - a) A description of the facility to be constructed, including a map to scale and GPS coordinates of the proposed location;
 - b) Relevant background information, including the data from geotechnical investigations, the results of programs to characterize soil, rock, Groundwater, ground ice, ground temperature conditions to the depth expected to be affected by the proposed facility, beneath the footprint of the facility, including runoff control structures, as deemed adequate by the Professional Engineer responsible for the design;
 - c) Quantities and the physical and geochemical characteristics of materials required for construction;
 - d) Design drawings and specifications of the facility, stamped by a Professional Engineer;
 - e) Stability analyses;
 - f) Construction considerations, including timing, sequencing, and a schedule;
 - g) A Quality Control Plan stamped by a Professional Engineer, a component of which includes a plan for a Professional Engineer to supervise and field check to construction activities;
 - h) Operations and maintenance requirements for the facility, including but not limited to the following:
 - i. Descriptions of material inputs [and acceptance criteria](#);
 - ii. Expected volumes of contaminated soil and snow;
 - iii. Leachate management methodologies;
 - iv. Methods and frequencies for any conditioning proposed to promote remediation;
 - v. Descriptions of the monitoring program for assessing soil and leachate chemistry within the facility, including, but not limited to, sampling locations and frequencies, and parameters to be measured;
 - vi. Remediation criteria;
 - vii. Methods for monitoring that the contaminated materials are effectively contained within the facility;
 - viii. Detailed instrumentation and monitoring plans, including but not limited to the following: sampling locations and frequencies, parameters to be measured, settlement, slope stability, ~~groundwater~~[Groundwater](#) seepage and contaminant transport, and liner performance, and,
 - ix. A closure and reclamation plan for the facility,
2. The **Final Detailed Construction Plan - Solid Waste Disposal Facility** referred to in Part E, item 7 of this Licence, shall include, but not be limited to, the following information:
 - a) A description of the facility to be constructed, including a map to scale and GPS coordinates of the proposed location;
 - b) Relevant background information, including the data from geotechnical investigations, the results of programs to characterize soil, rock, Groundwater, ground ice, and ground temperature conditions to the depth expected to be affected by the proposed facility, beneath the footprint of the facility including runoff control structures, as deemed adequate by the Professional Engineer responsible for the design;
 - c) Quantities and the physical and geochemical characteristics of materials required for construction;
 - d) Design drawings and specifications of Engineered Structures, [stamped by a Professional Engineer](#);
 - e) Stability analyses;
 - f) Construction considerations, including timing, sequencing, and a schedule;

- g) The details of a volume balance and Solid Waste Disposal Facility sizing that considered but is not limited to: refuse volume and density, cover material volume and density, and material balance;
 - h) A Quality Control Plan stamped by a Professional Engineer, a component of which includes a plan for a Professional Engineer to supervise and field check construction activities;
 - i) Operations and maintenance requirements for the facility, including but not limited to the following:
 - i. Descriptions of material inputs;
 - ii. Expected volumes of leachate and management methodologies;
 - iii. Leachate management methodologies;
 - iv. Detailed instrumentation and monitoring plans, including but not limited to the following: sampling locations and frequencies, parameters to be measured, settlement, slope stability, ~~groundwater~~Groundwater seepage and contaminant transport, and liner performance, and,
 - ii) A closure and reclamation plan for the facility, including an engineered final cover design, including, but not limited to health and safety considerations, vector and wildlife control, Water balance for net infiltration, material characteristics and configuration, and, final slopes and contouring to ensure the closed facility is geotechnically stable and Water pooling and erosion are minimized.
3. The **Tailings Containment Area Cover Design Study**, referred to in Part E, item 8 of this Licence shall include, but not be limited to, the following information:
- a) A cover design alternatives analysis, including pros and cons;
 - b) A summary table of cover design input variables noting what is known (measured or assumed) and unknown, with description of the limitations of assumed and unknown variables on cover performance;
 - c) A summary of how the results of the Tailings Containment Area Monitoring Plan referred to in Part G, item 10 of this Licence ~~and monitoring program were~~as integrated into the design and monitoring of the cover system;
 - d) The ~~e~~Engineered design with supporting analysis, and description of the purpose of each component of the cover system;
 - e) The construction and materials specifications for the cover system;
 - f) The construction and materials Quality Assurance and Quality Control Plan program for the cover system;
 - g) The details of a monitoring program to assess, but not be limited to: cover performance; oxygen ingress into Tailings; net infiltration into Tailings; and, solids and pore Water geochemistry;
 - h) The details of how the monitoring program will confirm design assumptions;
 - i) A Contingency Plan outlining measures to be implemented should cover failure occur;
 - j) A Dust Management Plan for work occurring on the Tailings ponds; and,
 - k) An analysis as to how the provisions of the Geochemical Load Balance Model referred to in Part G, item 7 of this Licence contribute to a closure and reclamation plan.
4. The **Final Detailed Construction Plans – Dry Stack Tailings Facilities TSF4b, TSF7, and TSF6** referred to in Part E, item ~~89~~ of this Licence, shall include, but not be limited to, the following information:
- a) A description of the facilities to be constructed, including locations;
 - b) Relevant background information, including the data from geotechnical investigations, as deemed adequate by the Professional Engineer responsible for the design;
 - c) Relevant supporting information, including the results from any relevant monitoring, research, or modelling programs, and an explanation of how this information has been considered in the Final Detailed Design Plans;

- d) For TSF6, the results of a hydro-technical analysis of potential interactions with the Flat River for the design flood event, and an explanation of how this information has been considered in the Final Detailed Design Plans, including any mitigation measures;
 - e) Design drawings and specifications of the facility and any Water management structures, stamped by a Professional Engineer;
 - f) Construction and material specifications, including geotechnical properties of the Tailings;
 - g) Stability and sensitivity analyses;
 - h) Deformation ranges;
 - i) Construction considerations, including timing, sequencing, and a schedule;
 - j) Detailed instrumentation and monitoring plans, including but not limited to sampling locations, parameters measured, and frequencies of sampling to be carried out; and
 - k) A Quality Assurance and Quality Control Plan stamped by a Professional Engineer, a component of which includes a plan for a Professional Engineer to supervise and field check construction activities.
5. The **Final Detailed Cover Design Plan – Dry Stack Tailings Facilities TSF4b, TSF7, and TSF6** referred to in Part E, items 109 and 11 of this Licence, shall be signed and stamped by a Professional Engineer, and shall include, but not be limited to, the following information:
- a) Cover design alternatives analyses;
 - b) Summary table of cover design input variables noting what is known (measured or assumed) and unknown, with description of the limitations of assumed and unknown variables on cover performance;
 - c) Summary of how the results of any relevant monitoring, research, or modelling programs are integrated into the Final Cover Design;
 - d) **Design drawings and specifications, stamped by a Professional Engineer;**
 - e) Construction and material specifications, including sources of materials;
 - f) **A Quality Assurance and Quality Control Plan, a component of which includes a plan for a Professional Engineer to supervise and field check construction activities;**
 - e)g) A monitoring program to assess, but not be limited to: cover performance; oxygen ingress into Tailings; net infiltration into Tailings; and, solids and pore Water geochemistry;
 - f)h) A description of how the monitoring program will confirm design assumptions;
 - g)i) A Contingency Plan outlining measures to be implemented should cover failure occur;
 - h)j) An analysis as to how the provisions of the Final Cover Design contribute to a closure and reclamation plan.

Schedule 3

Part G – Waste and Water Management

1. The **Water Management and Mine-site Erosion and Sediment Protection Plan**, referred to in Part G, item 3 of this Licence shall include, but not be limited to the following information:
 - a) Information regarding Water management:
 - i. A summary, with appropriate maps or diagrams, of components of the Water management system and all the Water and Waste~~water~~ streams that report to and from it;
 - ii. A qualitative and quantitative description of hydrological settings, including, but not limited to, climate, hydrology, and hydrogeology;
 - iii. A description of the processes and facilities intended for the purposes of:
 - 1) Obtaining freshwater from the Flat River;
 - 2) Managing surface runoff from the ~~Project undertaking (including the storm drain system);~~
 - 2)3) ~~Diverting surface run-on Water;~~
 - 3)4) ~~Collecting and managing of any wastewater liquid Wastes~~ resulting from the ~~Project undertaking; and~~
 - 4)5) ~~The management of Managing Sewage; and,~~
 - iv. ~~An overall~~ Water balance for the ~~Project's mine site and~~ major ~~mine~~ facilities, (including, but not limited to, the mill, underground mine, Tailings Containment Area, Dry Stack Tailings Storage Facilities), a schematic representation, and description of when the Water balance will be recalculated; and;
 - v. ~~A detailed Water balance for the Tailings Containment Area;~~
 - vi. ~~A detailed Water balance for the Dry Stack Tailings Storage Facilities;~~
 - vii. ~~A depiction of surface Water flow direction(s) overlaid on a topographic map that includes relevant mine facilities and topographic features; and~~
 - viii. ~~Any other information required to describe how Water and liquid Waste water will be managed such that the objectives listed in Part G, item 1 of this Licence are achieved;:-~~
 - b) Information regarding erosion and sediment control methodologies:
 - i. A summary, with appropriate maps or diagrams, of the ~~Project undertaking~~ identifying areas susceptible to erosion;
 - ii. The process and criteria for assessing erosion risk;
 - iii. A description of the best management practices that will be employed for different activities and for different levels of assessed risk; ~~and~~
 - iv. Any other information required to describe how erosion and sedimentation ~~released into the Receiving Environment~~ will be minimized;
 - c) Information regarding monitoring activities:
 - i. Details of monitoring, including rationale, for each component of the Water management system;
 - ii. Details of monitoring, including rationale, that will be undertaken with respect to erosion and sediment control;
 - iii. A map of the ~~s~~Surface Water and Groundwater quality monitoring locations, ~~including that includes~~ relevant ~~mine~~ facilities and topographic features; ~~and~~
 - iv. Linkages to other monitoring programs in this Licence;
 - d) Information regarding responses to monitoring results:
 - i. A description of how the Licensee will link the results of monitoring to those corrective actions necessary to ensure that the objective listed in Part G, item 1 of this Licence is met. This description shall include:

- 1) Definitions, with rationale, for Action Levels applicable to the performance of the Water management facilities, ~~Tailings and Tailing Containment Area, and Dry Stack Tailings Storage Facilities, with respect to geotechnical stability, thermal characteristics, Seepage quality and quantity, and runoff and erosion and sedimentation control measures (not including the Tailings Containment Area and Dry Stack Tailings Storage Facilities); and,~~
 - 2) For each Action Level, a description of how exceedances of the Action Level will be assessed and generally, which types of actions will be taken for the Action Levels exceeded;
 - ii. Action Level exceedances and actions taken during the year shall be reported in the Annual Water Licence Report as per Part B, item 11 of this Licence.
2. The **Flat River Erosion and Sediment Protection Plan**, referred to in Part G, item 4 of this Licence shall include, but not be limited to the following information:
 - a) A flood evaluation;
 - b) A description of how the engineering designs of the Tailings Containment Area and the Dry Stack Tailings Storage Facilities address floods associated with a flow rate that has an annual exceedance probability of 1/3 between the 1/1000 year flood and the probable maximum flood;
 - c) A summary of the engineering design, material characteristics, and construction details for erosion protection and slope armoring of the Tailings Containment Area and the Dry Stack Tailings Storage Facilities;
 - d) A description of flood control and flood response actions;
 - e) Details of the monitoring program demonstrating the effectiveness and maintenance of all erosion and sediment control measures and vegetation success;
 - f) A description of flood control and flood response actions; and
 - g) An analysis as to how the provisions of Part G, Item 4 contribute to a closure and reclamation plan.
3. The **Hydrogeological Groundwater Study Report**, referred to in Part G, item 5 of this Licence shall include, but not be limited to, the following information:
 - a) An update to the Hydrogeological Groundwater Study, dated December 30, 2013;
 - b) Updated exfiltration rates and exfiltration pathways for all Tailings ponds and storage facilities;
 - c) Based on modelling data, a description of potential changes to the hydrogeologic regime as a result of each Dry Stack Tailings Storage Facility;
 - d) A discussion and interpretation of results from the Hydrogeological Groundwater Study, including a description of the study methods and assumptions in the study; and,
 - e) ~~An analysis as to how the provisions of Part G, item 5 contribute to a closure and reclamation plan.~~
4. The **Geochemical Risk Assessment Report**, referred to in Part G, item 6 of this Licence shall include, but not be limited to, the following information:
 - a) An initial desktop survey of historical construction records, photos and correspondence to determine the history of Tailings and Waste Rock deposition on site and past use of Tailings and Waste Rock for construction (e.g. Tailings embankments, road construction);
 - b) An inventory of the quantity of potentially acid generating materials on site and the areas affected by these materials and exposures (including Tailings, Waste Rock, the underground mine and exposed walls);
 - c) A description of how the testing conducted provides an understanding of the character of the ~~mine~~ Wastes from each potential source (including each Tailings pond, Waste Rock piles, the underground mine and pit walls);

- d) Field and laboratory kinetic testing of potentially acid generating and potentially non-acid generating material to determine current source concentrations and to predict future source concentrations from these materials. The field and laboratory program shall incorporate, but not be limited to, the following:
 - i. Eight (8) field leach kinetic tests;
 - ii. Scale should be sufficiently large to include at least one hundred and fifty (150) kilograms (kg) of Waste material;
 - iii. Material placed in leaching tests should have geological description and solid phase geochemical characterization (static test) to allow association with comparable ~~mine~~ Waste at the site;
 - iv. At least two (2) field tests should include Tailings to evaluate variable pH conditions and variable elemental content;
 - v. Monitoring wells installed in Tailings ponds to measure chemistry near Tailings cover interface in Tailings Ponds 1 and 2, and near the base of the impoundment in Tailings Ponds 1 and 2, and Tailings Ponds 3 or 4;
 - vi. A research monitoring well installed in exposed acidic Tailings on the Flat River flood plain; and,
 - vii. Materials identified as requiring additional kinetic testing based on the extent of the field kinetic test program and the ~~mine~~ Waste inventory;-
- e) Static testing of:
 - i. Waste Rock produced from underground mine to document ARD risk of material deposited in the Waste Rock dump;
 - ii. Base material and surface material from the airstrip; and;
 - iii. Materials identified as requiring additional static testing based on the quantity and type of Waste Rock that is determined from a ~~mine~~ Waste inventory;
- f) A detailed Water balance for the site, including on-site measurements of precipitation, evaporation, intake to the mill from the Flat River, and ~~d~~Discharge from the Project mine-site (including Tailings ponds, seepage, and culverts);
- g) The establishment of management plans for current and future site conditions with respect to Acid Rock Drainage or Metal Leaching potential, including mitigation measures and contingencies for exceedances; and;
- h) An analysis by a Professional Engineer or Professional Geoscientist as to how the provisions of Part G, item 6 contribute to a closure and reclamation plan.

3.5. The **Integrated Geochemical Load Balance and Risk Assessment Report**, referred to in Part G, item 9 of this Licence shall include, but not be limited to, the following information:

- a) Updates to the Geochemical Risk Assessment referred to in Part G, item 6 of this Licence and the Geochemical Load Balance Model referred to in Part G, item 7 of this Licence, to include the Dry Stack Tailings Storage Facilities;
- b) Results from any additional studies and analyses recommended in the Geochemical Load Balance referred to in Part G, item 7 of this Licence;
- c) Results from any additional studies or monitoring recommended in the Information Gap Analysis Report referred to in Part G, item 8 of this Licence; and;
- d) An analysis of how the information provided in this Report contributes to a closure and reclamation plan.

4.6. The **Tailings Containment Area Monitoring Plan**, referred to in Part G, item 10 of this Licence shall include, but not be limited to, the following information:

- a) A summary table of cover design input variables noting what is known (measured or assumed) and unknown;
- b) The rationale, detailed methods, and equipment employed for proposed monitoring;

- c) A description of how the field monitoring program will assist in designing the cover, this shall include, but not be limited to: cover material characteristics; oxygen ingress and net infiltration into Tailings; moisture content and suction profiles with depth in the Tailings ponds; solids and pore Water geochemistry profile with depth in the Tailings ponds; and Water table in Tailings ponds;
- d) A description of proposed methods to predict post-closure conditions for different Tailings cover options along with the evolution of oxidation and geochemistry in the Tailings;
- e) A discussion of cover materials, availability, sampling, locations and quantity of source material identified with summary of field and lab results; and,
- f) An analysis by a Professional ~~an~~ Engineer or Professional Geoscientist as to how the provisions of Part G, Item 10 contribute to a closure and reclamation plan.

5.7. The **Historical Data and Interpretation Report of the Cantung Mine Site**, referred to in Part G, item 12 of this Licence shall include, but not be limited to, the following information:

- a) All historical sampling data concerning Project Cantung Mine Site from all available sources;
- b) Illustrate all trends from the data in Part F Schedule 5, item 8(a); Item 12(a);
- c) Provide an analysis of all the trends illustrated in Part F, Item 12 Schedule 5, item 8(b); and,
- d) An analysis by a Professional ~~an~~ Engineer or Professional Geoscientist as to how the provisions of Part G, Item 12 contribute to a closure and reclamation plan.

6.8. The **Tailings Processing and Storage Facilities Management and Monitoring Plan**, referred to in Part G, item 14 of this Licence shall include, but not be limited to, the following information:

- a) A description of the physical properties of Tailings, including but not limited to, particle size, dry density, void ratio, and Water Content;
- b) An evaluation of Tailings disposal options and alternatives;
- c) A qualitative and quantitative discussion outlining reasoning for selected Tailings disposal options;
- d) An engineering discussion on Tailings volume and storage capacity as a function of time for each facility and overall; and, where applicable, Tailings storage volume as a function of elevation;
- e) An evaluation of remaining storage capacity compared to mine reserves;
- f) A Tailings deposition plan, including timelines and sequencing;
- g) A description of Tailings deposition methods and procedures;
- h) Operations, maintenance, and surveillance information for the Dry Stack Tailings Processing Facility;
- i) Operations, maintenance, and surveillance information for the Dry Stack Tailings Storage Facilities;
- j) Operations, maintenance, and surveillance information for the Tailings Containment Area, in accordance with the requirements of the *Dam Safety Guidelines*;
- k) A summary of Water management for the Tailings Containment Area and the Dry Stack Tailings Storage Facilities, including run-on and run-off Water, Tailings contact water, and seepage from the facilities;
- l) The details of sedimentation and erosion control for the Tailings Containment Area and the Dry Stack Tailings Storage Facilities;
- m) The details of dust management for the Tailings Containment Area and the Dry Stack Tailings Storage Facilities;
- n) The details of all geotechnical, geochemical, dust, and Water quantity and quality monitoring that will be undertaken, including but not limited to sampling locations, parameters measured, and frequencies of sampling;
- o) Linkages to other monitoring programs required in this Water Licence;
- p) Information regarding responses to monitoring results:

- i. A description of how the Licensee will link the results of monitoring to those corrective actions necessary to ensure that the objective listed in Part G, item 1 of this Licence is met. This description shall include:
 - a) Definitions, with rationale, for Action Levels applicable to the performance of the Tailings management facilities; and
 - b) For each Action Level, a description of how exceedances of the Action Level will be assessed and generally, which types of actions will be taken for the Action Levels exceeded;
 - ii. Action Level exceedances and actions taken during the year shall be reported in the Annual Water Licence Report as per Part B, item 13 of this Licence.
- p)g) An analysis by a Professional Engineer as to how the provisions of Part G, Item 12 contribute to a closure and reclamation plan.

45-16. The **Groundwater Pumping Contingency Plan**, referred to in Part G, item 15 of this Licence, shall describe actions to be taken if the Water quality at Surveillance Network Program stations 4-27-4, 4-27-7 to 4-27-16, 4-28-1 and 4-28-2 inclusive, exceed the requirements specified in Part E, Item 19; and shall include, but is not limited to, the following:

- b. The details on how the Licensee plans to collect exfiltrate Waters from Tailings Ponds 1, 2, 3, 4, and 5;
- c. The details on specific Water quality limits that will trigger pumping from each ~~groundwater~~Groundwater extraction well;
- d. The details on expected ~~groundwater~~Groundwater extraction rates, duration of extraction, and Water quality for each ~~groundwater~~Groundwater extraction well;
- e. The details on disposal location for ~~groundwater~~Groundwater produced from extraction wells;
- f. The details on a volumetric Water balance for the disposal location including all sources and sinks of Water and demonstrate that the disposal location is capable of retaining the produced Water from the wells;
- g. The depiction of the expected capture zone for each ~~groundwater~~Groundwater extraction well, under the expected ~~groundwater~~Groundwater extraction rates, on a topographic map depicting Tailings Ponds 1, 2, 3, 4, and 5, and topographic features; and
- h. Should existing ~~groundwater~~Groundwater extraction wells be incapable of collecting exfiltrate Waters from Tailings Ponds 1, 2, 3, 4, or 5, installation of additional ~~groundwater~~Groundwater extraction wells shall be considered as a method to fulfill the objectives of the Groundwater Pumping Contingency Plan.

7-9. The **Flat River Hydrology Plan**, referred to in Part G, item 19 of this Licence shall include, but not be limited to, the following information:

- a) A description of the hydrologic monitoring stations and their locations;
- b) A description of the methodology used for the measurement of the Flat River flow rate in all seasons;
- c) Frequency of monitoring and measuring of the Flat River flow rate;
- d) The details on how the Licensee determines when to change (increase or decrease) the maximum allowable ~~D~~discharge rate from the WWTF; and,
- e) The details on how the Licensee will report the information gathered under this Plan.

10. The Nitrogen Response Plan, referred to in Part G, item 23 of this Licence shall include, but not be limited to, the following information:

- a) An assessment and quantification of sources of nitrogen (including nitrite, nitrate, and ammonia) discharged to the Flat River from the Wastewater Treatment Facilities;
- b) A description of the ecological implications of each form of nitrogen (including nitrite, nitrate, and ammonia) discharged to the Flat River;

- c) A description of current practices for minimizing the amount and concentration of nitrogen (including nitrite, nitrate, and ammonia) discharged to the Flat River from the Wastewater Treatment Facilities;
- d) A summary of investigations into mitigation measures that would reduce the amount and concentration of nitrite discharged to the Flat River from the Wastewater Treatment Facilities; and
- e) Proposed mitigation measures to reduce the amount and concentration of nitrite discharged to the Flat River from the Wastewater Treatment Facilities, including a schedule for implementation and a discussion of how all nitrogen ~~EQ~~effluent quality criteria will be met.

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Schedule 4

Part H – Aquatic Effects Monitoring (AEMP)

1. The **AEMP Design Plan** referred to in Part H, item 2 of this Licence shall include, but not be limited to, the following:
 - a) A conceptual site model that describes the pathways of potential effects from the Project to the aquatic ecosystem and their relationships to the ecological characteristics within the Receiving Environment. The conceptual site model will clearly define testable hypotheses for the AEMP as well as a justification of assessment and measurement endpoints;
 - b) A description of the types of monitoring conducted under the AEMP:
 - i. Monitoring for the purpose of measuring Project-related effects on the following components of the Receiving Environment:
 - a. Hydrology;
 - b. Surface Water quality;
 - c. Sediment quality;
 - d. Lower trophic organisms including plankton and benthic invertebrates;
 - e. Fish habitat and community;
 - f. Fish health;
 - g. Contaminants in fish tissue;
 - h. The taste of fish; and,
 - i. Any other Receiving Environment components necessary to fulfill the objectives of Part H, item 1 of this Licence.
 - c) A description of the AEMP sampling and analysis plan required to satisfy the objectives of Part H, item 1 of this Licence and incorporate the specific monitoring activities listed in Schedule 6, item 1(b). The sampling and analysis plan shall include:
 - i. A description of the area to be monitored including maps showing all sampling and reference locations as well as the overall predicted zone of influence of the Project (i.e., predicted zone of influence of mining operations or any other disturbance activities);
 - ii. The variables, sample media, monitoring protocols, and quality assurance and quality control procedures;
 - iii. Statistical design criteria, including a description of sampling frequencies for each parameter that ensure both accurate characterization of short-term variability, the collection of sufficient data to establish long-term trends, and a method to conduct trend analysis;
 - iv. A description of procedures to analyze and interpret data collected for each component including a procedure to integrate the results of individual monitoring components;
 - v. The quality assurance and quality control procedures that will ensure any future changes in monitoring protocols will be calibrated to initial monitoring protocols and data sets so that continuity, consistency, validity, and applicability of monitoring results will be maintained. This program shall also explicitly describe the measures that will be taken to identify and address any information deficiencies; and,
 - vi. A description of how relevant Surveillance Network Program and other monitoring will be incorporated into or coordinated with the AEMP.
 - d) Procedures to minimize the impacts of the AEMP on fish populations and fish habitat;
 - e) A description of the approaches to be used to evaluate and adjust the AEMP;
 - f) A summary of how Traditional Knowledge has been collected and incorporated into the AEMP, as well as a summary of how Traditional Knowledge will be incorporated into further studies relating to the AEMP;

- g) A description of an AEMP Response Framework that will link the results of the AEMP to those actions necessary to ensure that Project-related effects on the Receiving Environment remain within an acceptable range or are otherwise minimized to the extent practical. The Response Framework shall include:
 - i. Definitions, with rationale, for Significance Thresholds and tiered Action Levels applicable to the aquatic Receiving Environment of the Project; and
 - ii. For each Action Level,
 - a. A description of the rationale including, but not limited to, a consideration of predictions as well as AEMP results to date;
 - b. A description of how exceedances of Action Levels will be assessed; and
 - c. A general description of what types of actions may be taken if an Action Level is exceeded.
 - h) A description of the Annual AEMP Report format;
 - i) A plain language description of the program objectives, methodology, and interpretative framework; and
 - j) When updates are made to the AEMP Design Plan, a summary will be included of changes to the AEMP design since the last approved design and a rationale for the changes.
2. The **Aquatic Effects Re-evaluation Report** referred to in Part H, item 5 of this Licence shall include, but not be limited to, the following:
- a) A review and summary of AEMP data collected to date including a description of overall trends in the data and other key findings of the monitoring program;
 - b) An analysis that integrates the results of individual monitoring components (e.g., Water quality, sediment, fish health, etc.) to date and describes the overall ecological significance of the results;
 - c) A comparison of measured Project-related aquatic effects to predictions and an evaluation of any differences and lessons learned;
 - d) Updated predictions of Project-related aquatic effects or impacts from the time of writing to the end of Project life based on AEMP results to date and any other relevant operational monitoring data;
 - e) A plain language summary of the major results of the above analyses and a plain language interpretation of the significance of those results;
 - f) Recommendations, with rationale, for changes to Action Levels;
 - g) Recommendations, with rationale, for changes to any aspect of the AEMP Design Plan; and
 - h) Any other information required to meet the objectives listed in Part H, item 1 of this Licence or as requested by the Board.
3. The **AEMP Annual Report** referred to in Part H, item 6 of this Licence shall include, but will not be limited to, the following:
- a) A plain language summary of the major results obtained in the preceding calendar year and a plain language interpretation of the significance of those results;
 - b) A summary of activities conducted under the AEMP;
 - c) An update of the Project development activities and any accidents, malfunctions, or spills within the report time frame that could influence the results of the AEMP;
 - d) Tabular summaries of all data and information generated under the AEMP in an electronic and printed format acceptable to the Board;
 - e) An interpretation of the results, including an evaluation of any identified environmental effects that occurred as a result of the Project;
 - f) An analysis that integrates the results of individual monitoring components collected in a calendar year and describes the ecological significance of the results;
 - h) A comparison of monitoring results to Action Levels as set in the AEMP Design Plan;
 - i) An evaluation of the overall effectiveness of the AEMP to date;
 - j) Recommendations for refining the AEMP to improve its effectiveness as required; and

- k) Any other information specified in the approved AEMP Design Plan or that may be requested by the Board before November 1 of any year.
4. The **AEMP Response Plan** referred to in Part H, item 7 of this Licence shall contain the following information for each parameter that has been reported in the AEMP Annual Report to have exceeded an Action Level:
- a) A description of the parameter, its relation to Significance Thresholds and the ecological implication of the Action Level exceedances;
 - b) A summary of how the Action Level exceedance was determined and confirmed;
 - c) Recommended values for subsequent Action Levels;
 - d) A description of likely causes of the Action Level exceedances and potential mitigation options if appropriate;
 - e) A description of actions to be taken by the Licensee in response to the Action Level exceedances including:
 - i. A justification of the selected action, which may include a cost/benefit analysis;
 - ii. A description of timelines to implement the proposed actions;
 - iii. A projection of the environmental response to the planned actions, if appropriate;
 - iv. A monitoring plan for tracking the response to the actions, if appropriate; and
 - v. A schedule to report on the effectiveness of actions and to update the AEMP Response Plan as required; and
 - f) Any other information necessary to assess the response to an Action Level exceedance or that has been requested by the Board.

Signed the XX day of XXX, XXX on behalf of the Mackenzie Valley Land and Water Board

Chair

Witness

Annexes
Annexed to Water Licence MV2915L2-0003
North American Tungsten Corporation Ltd. – Cantung Mine

Table of Contents

- Annex A: Surveillance Network Program
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Annex A - Surveillance Network Program (SNP), referred to in Part B, item 11 of Water Licence MV2015L2-0003

Commented [Staff91]: This section of the Licence has been reorganized and reformatted to conform with more recently issued Licences. Yellow highlighted information is new to this Licence. Please provide comments and recommendations regarding this Annex.

Table of Contents:

Annex A: Surveillance Network Program (SNP)

Part A: Reporting Requirements

Part B: Site Descriptions

Part C: Other Monitoring Requirements

Part D: Meteorological Monitoring Requirements

Part A: Reporting Requirements

1. The effective date of this Surveillance Network Program is January 30, 2009.
2. **Beginning** January 30, 2009, and for every month thereafter, the Licensee shall, within sixty (60) days following the month being reported, submit to the Board and an Inspector, a **Surveillance Network Program Report**, which shall include, but not be limited to the following:
 - a) Electronic and tabular summaries of all data and information generated under the Parts B and C of this Annex for the month being reported, including rationale for SNP stations where samples were not collected and results and interpretation of quality assurance/quality control procedures;
 - b) Graphical summaries and interpretation of the analytical results from the SNP samples collected at the points of compliance (SNP stations 4-27-4, 4-27-7 to 4-27-16 (inclusive), 4-28-1, 4-28-2, 4-34, and 4-43) compared to the Effluent Quality Criteria under **Part E** of this Licence, for the previous two (2) consecutive years;
 - c) An explanation of any actions taken in response to any exceedances of the Effluent Quality Criteria;
 - d) Information regarding the calibration and status of the meters and devices referred to in Part B, item 9 of this Licence;
 - e) The coordinates of all SNP stations that were established within the month being reported, including an updated map identifying the locations of all the SNP stations;**
 - e)f) A tabular summary of cumulative water use; and,**
 - g) Electronic and tabular summaries of all data and information generated under the Meteorological Monitoring Requirements referred to in Part C of this Annex.**
3. More frequent sample collection may be required at the request of an Inspector.
4. **All** sampling, sample preservation, and analyses shall be conducted in accordance with methods prescribed in the current edition of American Public Health Association's (APHA) *Standard Methods for the Examination of Water and Wastewater* at the time of analysis, or by other such methods approved by an Analyst.
5. **All** analyses shall be performed in a laboratory accredited by the Canadian Association for Laboratory Accreditation (CALA) for the specific analyses to be performed or as approved by an Analyst.
6. **Prior** to the collection of SNP samples, the Licensee shall submit to the Board and an Analyst, a **Quality Assurance and Quality Control Plan**, which shall include a list of techniques that will be used to collect and analyze samples collected under the SNP, for the purposes of quality assurance and quality control. The Analyst shall provide a recommendation to the **Board for consideration.**

Commented [Staff92]: Old Annex A, Part D, "Reports"

Commented [Staff93]: Old Annex A, Part B, item 10.

Commented [Staff94]: Old Annex A, Part B, item 11.

Commented [Staff95]: Connects to Old F.3

Commented [Staff96]: Old B.12

7. The Licensee shall ~~adhere~~ act in accordance with the Quality Assurance and Quality Control Plan, once approved, and shall annually review the Plan and make any necessary revisions to reflect changes in Operations or as directed by the Board. Revisions to the Plan shall be submitted to the Board for a decision.
8. If the Quality Assurance and Quality Control Plan is not approved by the Board, the Licensee shall revise the Plan according to the Analyst's direction and re-submit it to the Analyst for a decision.

Commented [Staff97]: Old Annex A, Part B, item 12

Commented [Staff98]: Old Annex A, Part B, item 13

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Part B: Site Descriptions

1. The location of the sampling sites is subject to approval of an Inspector.
2. The location of sampling sites and site-specific monitoring requirements are as follows:

Commented [Staff99]: This includes Old Annex A, B.1 re SNP station 44

SNP station Quick Reference Table

SNP station #	Description	Status
4-1	Flat River at the mine Project and mill freshwater intake, located in the Water Supply Facility.	Active
4-5	Flat River at bridge downstream of airstrip.	Active
4-6	Decant from active Tailings pond or inflow to Wastewater Treatment Facilities.	Active
4-9	Discharge of oil/Water separator at Metre 628 at Sardine Creek.	Inactive-discontinued
4-10	Any point between Tailings Pond 3 and Tailings Pond 4 where Seepage is visible.	Inactive
4-13	Discharge from "E" Zone.	Inactive
4-20	Drainage culvert from Stinky Pond.	Active
4-21	Water Survey of Canada Stream gauge located on Flat River.	Inactive
4-27-2	Groundwater monitoring well MW-2.	Inactive
4-27-4	Groundwater monitoring well MW-5.	Active
4-27-7	Groundwater monitoring well BH-43.	Active
4-27-8	Groundwater monitoring well BH-44.	Active
4-27-9	Groundwater monitoring well BH-53.	Active
4-27-10	TP4-07-MW01. Replacement for SNP station 4-27-6; groundwater Groundwater monitoring well BH-42, and includes piezometers BH42-3, BH42-2, and BH42-1.	Active
4-27-11	TP5-07-MW01.	Active
4-27-12	TP3-07-MW01. Replacement for SNP station 4-27-3; TP3-07-MW01/A, and includes piezometers MW3-10, MW3-6, and MW3-1.	Active
4-27-13	TP3-07-MW02. Replacement for SNP station 4-27-5; TP3-07-MW02/A, and includes piezometers MW6-13, MW6-8, and MW6-1.	Active
4-27-14	Groundwater well southeast of Tailings Pond 5TP5 (between small creek and TP5).	Active
4-27-15	Groundwater well southeast of airstrip.	Active
4-27-16	Groundwater well East of Tailings Pond TP 1 and 2. Replacement for SNP station 4-27-1; Groundwater monitoring well MW-1, and includes pizeometers MW1-10, MW1-6, MW1-1.	Active
4-27-17	Groundwater well upstream of mine the Project.	Active
4-27-18	Groundwater monitoring well (MW13-01) up-gradient of Tailings Storage Facility 7.	Active
4-27-19	Groundwater monitoring well down-gradient of Tailings Storage Facility 7.	Active
4-27-20	Groundwater monitoring well up-gradient of Tailings Storage Facility 6.	Active
4-27-21	Groundwater monitoring well (MW12-09) down-gradient of north end of Tailings Storage Facility 6.	Active
4-27-22	Groundwater monitoring well (MW12-3) down-gradient of middle of Tailings Storage Facility 6.	Active
4-27-23	Groundwater monitoring well (MW12-01) down-gradient of south end of Tailings Storage Facility 6.	Active

4-28-1	Groundwater pumping well PW-1.	Active
4-28-2	Groundwater pumping well PW-2.	Active
4-29	Flat River, three (3) kilometres upstream of pumphouse.	Active
4-30	Mill Tailings at Tails Box in Mill. Replacement for SNP station 4-11: Tailings Discharge pipe into active Tailings pond.	Active
4-31	Sardine Creek Upstream of oil-water separator.	Inactive
4-32	Sardine Creek.	Active
4-33	Far Field Downstream Station 8.5 km – Flat River.	Active
4-33R	Flat River, West of Tailings Storage Facility 6.	Active
4-34	Seepage down-gradient of the fuel berm.	Active
4-35	Decant from Sewage Disposal Facilities.	Inactive
4-36	Any point between Tailings Pond 3 and the Flat River, where Seepage is visible.	Active
4-37	Any point between Tailings Pond 4 and the Flat River, where Seepage is visible.	Active
4-38	Any point between Tailings Pond 1 and the Flat River, where Seepage is visible.	Active
4-39	Any point between Tailings Pond 2 and the Flat River, where Seepage is visible.	Active
4-40	Surface Water point on Flat River between Tailings Ponds 2 and 4.	Inactive
4-41	Surface Water point on Flat River downstream of Tailings Pond 3.	Inactive
4-42	Minewater pump in the mill. This station is a replacement for 4-12: Discharge from conveyor gallery.	Inactive
4-43	Effluent from the Wastewater Treatment Facilities (sample port).	Active
4-44	Surface water point on Flat River approximately 180 metres downstream of drainage channel from Stinky Pond.	Active
4-45	Middle Bridge, upstream of Stinky Pond Discharge to Flat River.	Active
4-46	Thickener Overflow/Effluent.	Active
4-47	Collection point within Tailings Storage Facility 7 for Seepage/contact Water.	Active
4-48	Collection point within Tailings Storage Facility 6 for Seepage/contact Water.	Active
4-49	Flat River, West of the North end of Tailings Storage Facility 6.	Active
4-50	Flat River, immediately downstream of Tailings Storage Facility 6.	Active

SNP station 4-1:

Description:	Flat River at the <u>Project mine</u> and mill freshwater intake, located in the Water Supply Facility.
Location:	N 6871361.36 E 540034.38 Elevation 1111.78
Sampling Frequency:	Continuously <u>by in-line monitoring</u>
Sampling Parameters:	Volume
Rationale:	Operational Monitoring:

Commented [Staff100]: These are new tables which provide a snapshot of all the active SNP stations. The stations themselves are not new.

SNP station 4-5:

Description:	Flat River at bridge downstream of airstrip.	
Location:	N 6869094.27 E 542519.57 Elevation 1101.19	
Sampling Frequency:	Monthly	
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, nitrite-nitrogen, chloride, fluoride, sulphate, total suspended solids, total dissolved solids, alkalinity, pH, hardness	
Rationale:	Operational Monitoring:	

Note: Footnotes are defined after the final table in Part B.

SNP station 4-6:

Description:	Decant from active Tailings pond or inflow to Wastewater Treatment Facilities.	
Location:	N 6870572 E 540699 Elevation 1139	
Sampling Frequency:	Monthly	
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia (NH ₃), nitrite-nitrogen (NO ₂ -N), nitrate-nitrogen (NO ₃ -N), Total Kjeldahl Nitrogen (TKN), total phosphorus (P), dissolved phosphorus (P), orthophosphate (PO ₄ ³⁻), Total Organic Carbon (TOC), and Biological Oxygen Demand (BOD), total kjeldahl nitrogen , ortho-phosphorous , chloride, fluoride, sulphate, total suspended solids, total dissolved solids, alkalinity, pH, hardness, faecal coliforms, EPH/BTEX ⁽²⁾	
Rationale:	Operational Monitoring:	

SNP station 4-20:

Description:	Drainage culvert from Stinky Pond.	
Location:	N 6870330.45 E 541342.06 Elevation 1104.58	
Sampling Frequency:	Every two (2) weeks and annually for toxicity testing ⁽³⁾	
Sampling Parameters:	ICP metal scan ⁽¹⁾ , nutrients ⁽²⁾ , ortho-phosphorous , chloride, fluoride, sulphate, total suspended solids, total dissolved solids, alkalinity, pH, hardness, faecal coliforms, toxicity testing ⁽³⁾	
Rationale:	Operational Monitoring:	

SNP station 4-27-4:

Description:	Groundwater monitoring well MW-5. If sufficient Water is available, a sample shall be collected from each piezometer: MW5-9, MW5-5, and MW5-1. The piezometric head and number shall be recorded.	
Location:	N 6870401.17 E 540469.07 Elevation 1107.71	
Sampling Frequency:	Three (3) times per year (approximately late June, August, and October)	Annually
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, sulphate, total suspended solids, alkalinity, pH, hardness, total organic carbon, EPH/BTEX ⁽²⁾	Total cyanide
Rationale:	Compliance Point	

SNP station 4-27-7:

Description:	Groundwater monitoring well BH-43. If sufficient Water is available, a sample shall be collected from each piezometer: BH43-12, BH43-6, and BH43-1. The piezometric head and number shall be recorded.	
Location:	N 6870529.79 E 541055.24 Elevation 1107.09	
Sampling Frequency:	Three (3) times per year (approximately late June, August, and October)	Annually
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, sulphate, total suspended solids, alkalinity, pH, hardness, total organic carbon, EPH/BTEX ⁽²⁾	Total cyanide
Rationale:	Compliance Point	

SNP station 4-27-8:

Description:	Groundwater monitoring well BH-44. If sufficient Water is available, a sample shall be collected from each piezometer: BH44-4, BH44-2, and BH44-1. The piezometric head and number shall be recorded.	
Location:	N 6870457.79 E 541150.52 Elevation 1107.5	
Sampling Frequency:	Three (3) times per year (approximately late June, August, and October)	Annually
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, sulphate, total suspended solids, alkalinity, pH, hardness, total organic carbon, EPH/BTEX ⁽²⁾	Total cyanide
Rationale:	Compliance Point	

SNP station 4-27-9:

Description:	Groundwater monitoring well BH-53. If sufficient Water is available, a sample shall be collected from each piezometer. The piezometric head and number shall be recorded.	
Location:	N 6871000.43 E 540482.62 Elevation 1109.97	
Sampling Frequency:	Three (3) times per year (approximately late June, August, and October)	Annually
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, sulphate, total suspended solids, alkalinity, pH, hardness, total organic carbon, EPH/BTEX ⁽²⁾	Total cyanide
Rationale:	Compliance Point	

SNP station 4-27-10:

Description:	TP4-07-MW01. If sufficient Water is available, a sample shall be collected from each piezometer. The piezometric head and number shall be recorded.	
Location:	N 6870580.59 E 540991.52 Elevation 1109.91	
Sampling Frequency:	Three (3) times per year (approximately late June, August, and October)	Annually
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, sulphate, total suspended solids, alkalinity, pH, hardness, total organic carbon, EPH/BTEX ⁽²⁾	Total cyanide
Rationale:	Compliance Point	

SNP station 4-27-11:

Description:	TP5-07-MW01. If sufficient Water is available, a sample shall be collected from each piezometer. The piezometric head and number shall be recorded.	
Location:	N 6869955.63 E 541215.91 Elevation 1125.2	
Sampling Frequency:	Three (3) times per year (approximately late June, August, and October)	Annually
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, sulphate, total suspended solids, alkalinity, pH, hardness, total organic carbon, EPH/BTEX ⁽²⁾	Total cyanide
Rationale:	Compliance Point	

SNP station 4-27-12:

Description:	TP3-07-MW01. If sufficient Water is available, a sample shall be collected from each piezometer. The piezometric head and number shall be recorded.	
Location:	N 6870091.54 E 541357.03 Elevation 1114.54	
Sampling Frequency:	Three (3) times per year (approximately late June, August, and October)	Annually
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, sulphate, total suspended solids, alkalinity, pH, hardness, total organic carbon, EPH/BTEX ⁽²⁾	Total cyanide
Rationale:	Compliance Point	

SNP station 4-27-13:

Description:	TP3-07-MW02. If sufficient Water is available, a sample shall be collected from each piezometer. The piezometric head and number shall be recorded.	
Location:	N 6869967.73 E 541326.91 Elevation 1119.35	
Sampling Frequency:	Three (3) times per year (approximately late June, August, and October)	Annually
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, sulphate, total suspended solids, alkalinity, pH, hardness, total organic carbon, EPH/BTEX ⁽²⁾	Total cyanide
Rationale:	Compliance Point	

SNP station 4-27-14:

Description:	Groundwater well southeast of Tailings Pond 5-TP5 (between small creek and TP5). If sufficient Water is available, a sample shall be collected from each piezometer. The piezometric head and number shall be recorded.	
Location:	N 6869942.9 E 541256.87 Elevation 1124.35	
Sampling Frequency:	Three (3) times per year (approximately late June, August, and October)	Annually
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, sulphate, total suspended solids, alkalinity, pH, hardness, total organic carbon, EPH/BTEX ⁽²⁾	Total cyanide
Rationale:	Compliance Point	

SNP station 4-27-15:

Description:	Groundwater well southeast of airstrip. If sufficient Water is available, a sample shall be collected from each piezometer. The piezometric head and number shall be recorded.	
Location:	N 6869880.3 E 541600.61 Elevation 1110.45	
Sampling Frequency:	Three (3) times per year (approximately late June, August, and October)	Annually
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, sulphate, total suspended solids, alkalinity, pH, hardness, total organic carbon, EPH/BTEX ⁽²⁾	Total cyanide
Rationale:	Compliance Point	

SNP station 4-27-16:

Description:	Groundwater well East of Tailings Pond TP 1 and 2. If sufficient Water is available, a sample shall be collected from each piezometer. The piezometric head and number shall be recorded.	
Location:	N 6871064.44 E 540502.87 Elevation 1111.15	
Sampling Frequency:	Three (3) times per year (approximately late June, August, and October)	Annually
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, sulphate, total suspended solids, alkalinity, pH, hardness, total organic carbon, EPH/BTEX ⁽²⁾	Total cyanide
Rationale:	Compliance Point	

SNP station 4-27-17:

Description:	Groundwater well upstream of mine the Project. If sufficient Water is available, a sample shall be collected from each piezometer. The piezometric head and number shall be recorded.	
Location:	N 6871380.14 E 539968.54 Elevation 1117.72	
Sampling Frequency:	Three (3) times per year (approximately late June, August, and October)	Annually
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, sulphate, total suspended solids, alkalinity, pH, hardness, total organic carbon, EPH/BTEX ⁽²⁾	Total cyanide
Rationale:		

SNP station 4-27-18:

Description:	Groundwater monitoring well (MW13-01) up-gradient of Tailings Storage Facility 7. If sufficient Water is available, a sample shall be collected from each piezometer. The piezometric head and number shall be recorded.	
Location:	N 6870369.63 E 540646.05 Elevation 1066.78	
Sampling Frequency:	Three (3) times per year (approximately late June, August, and October)	
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, sulphate, total suspended solids, alkalinity, pH, hardness, total organic carbon, EPH/BTEX ⁽²⁾	
Rationale:		

SNP station 4-27-19:

Description:	Groundwater monitoring well down-gradient of Tailings Storage Facility 7. If sufficient Water is available, a sample shall be collected from each piezometer. The piezometric head and number shall be recorded.	
Location:	N 6870788.48 E 540523.39 Elevation 1138.09	
Sampling Frequency:	Three (3) times per year (approximately late June, August, and October)	Annually
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, sulphate, total suspended solids, alkalinity, pH, hardness, total organic carbon, EPH/BTEX ⁽²⁾	Total cyanide
Rationale:		

SNP station 4-27-20:

Description:	Groundwater monitoring well up-gradient of Tailings Storage Facility 6. If sufficient Water is available, a sample shall be collected from each piezometer. The piezometric head and number shall be recorded.	
Location:	N 6868047.68 E 543765.09 Elevation 1109.67	
Sampling Frequency:	Three (3) times per year (approximately late June, August, and October)	Annually
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, sulphate, total suspended solids, alkalinity, pH, hardness, total organic carbon, EPH/BTEX ⁽²⁾	Total cyanide
Rationale:		

SNP station 4-27-21:

Description:	Groundwater monitoring well (MW12-09) down-gradient of north end of Tailings Storage Facility 6. If sufficient Water is available, a sample shall be collected from each piezometer. The piezometric head and number shall be recorded.	
Location:	N 6868150.03 E 543414.08 Elevation 1099.37	
Sampling Frequency:	Three (3) times per year (approximately late June, August, and October)	Annually
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, sulphate, total suspended solids, alkalinity, pH, hardness, total organic carbon, EPH/BTEX ⁽²⁾	Total cyanide
Rationale:		

SNP station 4-27-22:

Description:	Groundwater monitoring well (MW12-3) down-gradient of middle of Tailings Storage Facility 6. If sufficient Water is available, a sample shall be collected from each piezometer. The piezometric head and number shall be recorded.	
Location:	N 6867899.6 E 543593.31 Elevation 1097.01	
Sampling Frequency:	Three (3) times per year (approximately late June, August, and October)	Annually
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, sulphate, total suspended solids, alkalinity, pH, hardness, total organic carbon, EPH/BTEX ⁽²⁾	Total cyanide
Rationale:		

SNP station 4-27-23:

Description:	Groundwater monitoring well (MW12-01) down-gradient of south end of Tailings Storage Facility 6. If sufficient Water is available, a sample shall be collected from each piezometer. The piezometric head and number shall be recorded.	
Location:	MW12-01: N 6867627.55 E 544032.92 Elevation 1096.26 MW12-02: N 6867738.65 E 543861.24 Elevation 1094.35	
Sampling Frequency:	Three (3) times per year (approximately late June, August, and October)	Annually
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, sulphate, total suspended solids, alkalinity, pH, hardness, total organic carbon, EPH/BTEX ⁽²⁾	Total cyanide
Rationale:		

SNP station 4-28-1:

Description:	Groundwater pumping well PW-1. If sufficient Water is available, a sample shall be collected from each piezometer. The piezometric head and number shall be recorded.	
Location:	N 6870386 E 541224 Elevation 1092	
Sampling Frequency:	Monthly	Annually
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, sulphate, total suspended solids, alkalinity, pH, hardness, total organic carbon, EPH/BTEX ⁽²⁾	Total cyanide
Rationale:	Compliance Point: designated as final Discharge point in <i>Metal Mining Effluent Regulations</i> .	

SNP station 4-28-2:

Description:	Groundwater pumping well PW-2. If sufficient Water is available, a sample shall be collected from each piezometer. The piezometric head and number shall be recorded.	
Location:	N 6870491 E 541118 Elevation 1070	
Sampling Frequency:	Three (3) times per year (approximately late June, August, and October)	Annually
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, sulphate, total suspended solids, alkalinity, pH, hardness, total organic carbon, EPH/BTEX ⁽²⁾	Total cyanide
Rationale:	Compliance Point	

SNP station 4-29:

Description:	Flat River, three (3) kilometres upstream of pumphouse.	
Location:	N 6873871 E 538180 Elevation 1144	
Sampling Frequency:	Monthly	
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, nitrite-nitrogen, chloride, fluoride, sulphate, total suspended solids, total dissolved solids, alkalinity, pH, hardness	
Rationale:	Operational Monitoring:	

SNP station 4-30:

Description:	Slurry sample from Mill Tailings at Tails Box in Mill.	
Location:	N 6870912 E 540162 Elevation 1156	
Sampling Frequency:	Monthly	
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, sulphate, total dissolved solids, alkalinity	
Rationale:	Operational Monitoring:	

SNP station 4-32:

Description:	Sardine Creek.	
Location:	N 6871229.02 E 540123.65 Elevation 1123.42	
Sampling Frequency:	Monthly	
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, nitrite-nitrogen, chloride, fluoride, sulphate, total suspended solids, total dissolved solids, alkalinity, pH, hardness, EPH/BTEX ⁽²⁾	
Rationale:	Operational Monitoring:	

SNP station 4-33:

Description:	Far Field Downstream Station 8.5 km – Flat River.
Location:	N 6864181 E 547271 Elevation 1024
Sampling Frequency:	Monthly, if accessible
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, nitrite-nitrogen, chloride, fluoride, sulphate, total suspended solids, total dissolved solids, alkalinity, pH, hardness
Rationale:	Operational Monitoring:

SNP station 4-33R:

Description:	Flat River, West of Tailings Storage Facility 6.
Location:	N 6867874.61 E 543488.32 Elevation 1094.02
Sampling Frequency:	Monthly
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, nitrite-nitrogen, chloride, fluoride, sulphate, total suspended solids, total dissolved solids, alkalinity, pH, hardness
Rationale:	Operational Monitoring:

SNP station 4-34:

Description:	Seepage down-gradient of the fuel berm.
Location:	
Sampling Frequency:	Monthly, when Seepage is visible
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, nitrite-nitrogen, chloride, fluoride, sulphate, total suspended solids, total dissolved solids, alkalinity, pH, hardness, EPH/BTEX ⁽²⁾
Rationale:	Compliance Point

SNP station 4-36:

Description:	Any point between Tailings Pond 3 and the Flat River, where Seepage is visible.
Location:	N 6870158 E 541368 Elevation 1097
Sampling Frequency:	Monthly, when Seepage is visible
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, nitrite-nitrogen, chloride, fluoride, sulphate, total suspended solids, total dissolved solids, alkalinity, pH, hardness, EPH/BTEX ⁽²⁾
Rationale:	Operational Monitoring:

SNP station 4-37:

Description:	Any point between Tailings Pond 4 and the Flat River, where Seepage is visible.
Location:	
Sampling Frequency:	Monthly, when Seepage is visible
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, nitrite-nitrogen, chloride, fluoride, sulphate, total suspended solids, total dissolved solids, alkalinity, pH, hardness, EPH/BTEX ⁽²⁾
Rationale:	Operational Monitoring:

SNP station 4-38:

Description:	Any point between Tailings Pond 1 and the Flat River, where Seepage is visible.
Location:	
Sampling Frequency:	Monthly, when Seepage is visible
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, nitrite-nitrogen, chloride, fluoride, sulphate, total suspended solids, total dissolved solids, alkalinity, pH, hardness, EPH/BTEX ⁽²⁾
Rationale:	Operational Monitoring:

SNP station 4-39:

Description:	Any point between Tailings Pond 2 and the Flat River, where Seepage is visible.
Location:	
Sampling Frequency:	Monthly, when Seepage is visible
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, nitrite-nitrogen, chloride, fluoride, sulphate, total suspended solids, total dissolved solids, alkalinity, pH, hardness, EPH/BTEX ⁽²⁾
Rationale:	Operational Monitoring:

SNP station 4-40:

Description:	Surface Water point on Flat River between Tailings Ponds 2 and 4.
Location:	N 6870816.22 E 540858.16 Elevation 1106.23
Sampling Frequency:	Monthly
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, nitrite-nitrogen, chloride, fluoride, sulphate, total suspended solids, total dissolved solids, alkalinity, pH, hardness
Rationale:	Operational Monitoring:

SNP station 4-43:

Description:	Effluent from the Wastewater Treatment Facilities (sample port).
Location:	N 6870572 E 540699 Elevation 1139
Sampling Frequency:	Weekly
Sampling Parameters:	ICP metal scan ⁽¹⁾ , <u>total ammonia (NH₃)</u> , <u>nitrite-nitrogen (NO₂-N)</u> , <u>nitrate-nitrogen (NO₃-N)</u> , <u>Total Kjeldahl Nitrogen (TKN)</u> , <u>total phosphorus (P)</u> , <u>dissolved phosphorous (P)</u> , <u>orthophosphate (PO₄³⁻)</u> , <u>Total Organic Carbon (TOC)</u> , and <u>Biological Oxygen Demand (BOD)</u> , chloride, fluoride, sulphate, total suspended solids, total dissolved solids, alkalinity, pH, hardness, faecal coliforms
Rationale:	Compliance Point

SNP station 4-44:

Description:	Surface Water point on Flat River approximately 180 metres downstream of drainage channel from Stinky Pond. Boundary of mixing zone.
Location:	N 6870223.15 E 541477.31 Elevation 1104.62
Sampling Frequency:	When discharging at rates less than or equal to 4,500m ³ /day – sample monthly, or when discharging at rates above 4,500m ³ /day – sample weekly
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, nitrite-nitrogen, chloride, fluoride, sulphate, total suspended solids, total dissolved solids, alkalinity, pH, hardness
Rationale:	Compliance Point at the boundary of the mixing zone in the Flat River where Water quality objectives are to be met. ⁽⁴⁾

SNP station 4-45:

Description:	Middle Bridge, upstream of Stinky Pond Discharge to Flat River.
Location:	N 6868828 E 543144 Elevation 1104.62
Sampling Frequency:	Daily when required under Part G, item 37; otherwise, weekly.
Sampling Parameters:	Flow (<u>m³/day</u>)
Rationale:	Flow monitoring station for e Discharge rates detailed in Part F

SNP station 4-46:

Description:	Thickener Overflow/Effluent.
Location:	
Sampling Frequency:	Monthly, when the Thickener is operating
Sampling Parameters:	Total suspended solids
Rationale:	

SNP station 4-47:

Description:	Collection point within Tailings Storage Facility 7 for Seepage/contact Water.
Location:	
Sampling Frequency:	Weekly, when Water is present
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, nitrite-nitrogen, chloride, fluoride, sulphate, total suspended solids, total dissolved solids, alkalinity, pH, hardness
Rationale:	

SNP station 4-48:

Description:	Collection point within Tailings Storage Facility 6 for Seepage/contact Water.
Location:	
Sampling Frequency:	Weekly, when Water is present
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, nitrite-nitrogen, chloride, fluoride, sulphate, total suspended solids, total dissolved solids, alkalinity, pH, hardness
Rationale:	

SNP station 4-49:

Description:	Flat River, West of the North end of Tailings Storage Facility 6.
Location:	N 6868099.72 E 543343.79 Elevation 1095.36
Sampling Frequency:	Monthly
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, nitrite-nitrogen, chloride, fluoride, sulphate, total suspended solids, total dissolved solids, alkalinity, pH, hardness
Rationale:	

SNP station 4-50:

Description:	Flat River, immediately downstream of Tailings Storage Facility 6.
Location:	N 6867532.93 E 544026.55 Elevation 1090.83
Sampling Frequency:	Monthly
Sampling Parameters:	ICP metal scan ⁽¹⁾ , total ammonia, nitrate-nitrogen, nitrite-nitrogen, chloride, fluoride, sulphate, total suspended solids, total dissolved solids, alkalinity, pH, hardness
Rationale:	

Footnotes:

⁽¹⁾ The inductively coupled plasma (ICP) metal scan shall include, at a minimum, the total and dissolved concentrations for the following parameters: aluminum, arsenic, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, phosphorous, selenium, silver, strontium, thallium, tungsten, uranium, vanadium, zinc. ~~Hydride Atomic Absorption could also be used instead of an ICP technique.~~

⁽²⁾ EPH means extractable petroleum hydrocarbons. BTEX shall include: benzene, toluene, ethyl benzene, and xylene.

8) Toxicity shall be assessed at an accredited bioassay laboratory for the following analyses:

- a. Chronic toxicity – invertebrates using Environment Canada. 1992. Biological Test Method: Test of Reproduction and Survival Using the Cladoceran *Ceriodaphnia dubia*. Environmental Protection Series, Report EPS 1/RM/21. Method Development and Application Section, Environmental Technology Centre, Ottawa, ON, Canada.
- b. Chronic toxicity – algae using Environment Canada. 2007. Biological Test Method: Growth Inhibition Test Using a Freshwater Alga *Pseudokirchneriella subcapitata*. Environmental Protection Series, Report EPS 1/RM/25. Method Development and Application Section, Environmental Technology Centre, Ottawa, ON, Canada.
- c. Chronic toxicity – aquatic plants using Environment Canada. 2007. Biological Test Method: Test for Measuring the Inhibition of Growth Using the Freshwater Macrophyte, *Lemna minor*. Environmental Protection Series, Report EPS 1/RM/37. Method Development and Application Section, Environmental Technology Centre, Ottawa, ON, Canada.
- d. Sublethal toxicity – fish using Environment Canada. 2011. Biological Test Method: Test of Larval Growth and Survival Using Fathead Minnows. Environmental Protection Series, Report EPS 1/RM/22. Method Development and Application Section, Environmental Technology Centre, Ottawa, ON, Canada.

Commented [Staff101]: Board staff notes that these requirements are consistent with the toxicity testing required under the MMER for the project. This addition does not require an additional sampling event, but will ensure that the toxicity testing results are reported to the Board under the SNP.

(4) Water quality objectives to be met at the mixing zone boundary in the Flat River at SNP4-44:

Parameter	Water Quality Objective (mg/L)
Total Suspended Sediments	6
Total Ammonia as-N	1.27
Nitrite-nitrogen	0.06
Nitrate-nitrogen	3.0
Sulphate	-
Chloride	120
Fluoride	0.12
Total Aluminum	0.3
Total Arsenic	0.005
Total Boron	1.5
Total Cadmium	0.00021
Total Chromium	0.001
Total Copper	0.0032
Total Iron	1.3
Total Lead	0.005
Total Mercury	0.000026
Total Molybdenum	0.073
Total Nickel	0.125
Total Selenium	0.001
Total Silver	0.0001
Total Thallium	0.0008
Total Uranium	0.015
Total Zinc	0.03
pH	6.5-9

Part C: Other Monitoring Requirements

1. The Licensee shall record the following information for inclusion into the monthly SNP report referred to in Part A, item 2 of this Annex:
 - a) Weekly quantity of Water in cubic metres (m³) withdrawn from the Water Supply Facility;
 - b) Quantity of ore milled in tonnes per month;
 - c) Weekly quantity of Waste in cubic metres (m³) discharged to the Tailings Containment Area;
 - d) Weekly quantity of thickener overflow volume discharged to the Wastewater Treatment Facilities and/or Tailings Pond 5;
 - e) Weekly volume of contact Water discharged to the Wastewater Treatment Facilities or Tailings Pond 5 from each of the Dry Stack Tailings Storage Facilities;
 - f) Weekly quantity of liquid Waste in cubic metres (m³) discharged to Stinky Pond from the Wastewater Treatment Facilities;
 - g) Weekly flow and velocity at the Discharge culvert and channel between Stinky Pond and the Flat River. The operational status of the Wastewater Treatment Facilities shall be recorded when the measurements of flow and velocity are made;
 - h) Weekly discharge volume in cubic metres (m³) of the Flat River, measured at SNP S4-45. During transition periods between discharge rates, as outlined in the approved Hydrology Plan, referred to in Part X, item y of this Licence, the Licensee shall record and report the daily discharge volume of the Flat River, measured at S4-45, in cubic metres (m³) to the Board and an Inspector;
 - i) Results of the weekly lithological identification and sulphur plus carbon analyses used to determine acid generating potential of Waste Rock;
 - j) Monthly composite mill tails sample that is analysed and used to characterize the potential for Acid Rock Drainage potential;
 - k) Observations from the daily inspection of the Tailings Containment Area as required by Part E, Item 6(c) of this Licence;
 - l) Observations from the daily inspection of the Wastewater Treatment Facilities as required by Part E, Item 6(d);
 - m) Results of weekly dry stack Tailings moisture and density testing; and
 - n) Data from the piezometers and inclinometers, and other approved instrumentation installed in the Tailings Containment Area and the Dry Stack Tailings Storage Facilities.

Part D: Meteorological Monitoring Requirements

1. The Licensee shall measure and record the following meteorological data:
 - a) Mean, minimum and maximum daily temperatures, in degrees Celsius (°C);
 - b) Precipitation, measured and recorded in hourly and daily totals, in millimetres (mm);
 - c) Evaporation, as calculated by hourly and daily averages, in millimetres per day (mm/d) from a reasonable location near the Project, but sufficiently far away from manmade structures.
 - d) Wind speed, in kilometers per hour (km/h), including daily minima and maxima; and
 - e) Hourly wind direction.

Annex B: Concordance Table of Items Requiring Submission in Water Licence MV2015L2-0003

This table summarizes the information the Licensee is required to submit as per the Water Licence Conditions. It supplements the Water Licence. If there is any discrepancies between this table and the body of the Water Licence, the Water Licence conditions prevail.

Table 1: Concordance Table of Items Requiring Submission
(coming soon...)

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Annex C: Table of Revision History for Water Licence MV2015L2-0003

Table 1: Updates and changes that have been made to the Water Licence since issuance:

Date	Location of change	Description of change
-		

DRAFT

**MVLWB Work Plan for North American Tungsten Corporation Ltd.
Application for Water Licence Renewal MV2015L2-0003**

Dated: September 22, 2015

Purpose of the Work Plan

To outline the processes and timelines to be followed for North American Tungsten Corporation Ltd.'s (NATCL or Proponent) Water Licence (WL) Application MV2015L2-0003 for the Cantung Mine.

Background

On April 21, 2015, NATCL submitted an Application to renew WL MV2002L2-0019, which is set to expire on January 29, 2016. On March 16, 2015, the Mackenzie Valley Land and Water Board (Board) approved NATCL's Dry Stack Tailings WL Amendment Application and forwarded it to the Minister for approval. The Minister approved the Amendment Application on June 12, 2015, and the Amended Licence was issued by the Board on June 16, 2015.

Scope of the Proceeding

The primary objective of this proceeding is to update and modernize NATCL's existing Licence, and renew the term. NATCL has committed to develop an Aquatic Effects Monitoring Program for the Cantung Mine, and has also committed to update and finalize the Interim Closure and Reclamation Plan. NATCL has provided a work plan and timeline for development and submittal of these plans.

Guiding Principles

The following principles will guide the Work Plan throughout this licencing process:

- The license renewal process shall be carried out in a timely manner and shall have regard to the protection of the environment in consideration of the impacts of the proposed undertaking and the importance of conservation to the wellbeing and way of life of the aboriginal peoples of Canada (Section 35 of the *Constitution Act*, 1982);
- The Board will review NATCL's Application and consider potential licence conditions based on evidence and rationale submitted by the company or any other party; and
- The Board will review NATCL's Application and consider potential licence conditions in order to meet the Board's mandate and applicable policies and to ensure consistency in decision-making throughout the Mackenzie Valley.

Work Plan Objectives

The Work Plan is to achieve the following objectives:

- Compile a broad range of input through the review process;
- Ensure adequate information is gathered to complete the licence renewal process;
- Facilitate a thorough, inclusive, and timely licence review process; and
- Establish adequate WL conditions to ensure protection of the environment.

Opportunities for Community Engagement

- The Board required NATCL to engage with communities and aboriginal organizations regarding the licence renewal Application prior to its submission;
- The Board will distribute the licence renewal Application to reviewers – including aboriginal organizations, governments, and communities – for review using the Online Review System (ORS);
- The Board will include a notification(s) regarding the review process in the newspaper;

- The Board will coordinate a technical session(s) to address specific issues that require more focused review and discussion;
- The Board will hold a public hearing; and,
- The Board will hold any other consultation or engagement activity that the Board considers appropriate.

Materials Circulated for Comment by Parties

During the course of this proceeding, Board staff will review all evidence filed by the parties. These efforts are intended to identify issues or concerns which must be addressed in the licence and to resolve them, if possible, before the close of the proceeding. In order to focus these discussions, staff will prepare and circulate a draft licence for comment. This process allows parties to address the proposed terms and conditions for the licence in their presentations to the Board and to prepare argument setting out their positions with respect to these provisions at the close of the proceeding.

These staff efforts to develop and circulate a draft licence should focus discussion on appropriate terms and conditions for this authorization. The Board is not bound by the contents of any of these draft materials and will make its decision at the close of the proceeding on the basis of all the evidence and arguments filed by all parties.

Task	Responsible Party*	Date Due (Date Completed)
Application Submitted	Proponent	(April 21, 2015)
Application deemed complete & sent for review	MVLWB staff	(April 27, 2015)
Reviewer comments due on Application Package	Reviewers	(May 26, 2015)
Proponent response to Reviewer comments on Application Package	Proponent	(June 9, 2015)
Technical sessions	All Parties	(June 17, 2015)
Deadline to respond to Information Requests	All Parties	(June 25, 2015)
Pre-hearing Conference	All Parties	(July 7, 2015)
Deadline for Interventions	Interveners	(July 14, 2015)
Proponent response to Interventions	Proponent	(July 23, 2015)
Deadline for Intervener Public Hearing presentations	Interveners	(July 30, 2015)
Proponent Public Hearing presentation due	Proponent	(August 6, 2015)

Public Hearings	All Parties	August 26-27, 2015
Public Hearing Undertakings due 2 nd round of Information Requests from interveners and Proponent	All Parties	(August 27, 2015)
Responses to 2 nd round of Information Requests from Interveners and Proponent	All Parties	September 3, 2015 (September 10, 2015)
Circulate Draft WL**	MVLWB staff	September 10, 2015 (September 22, 2015)
Reviewer comments due on Draft WL	Reviewers	September 24, 2015 October 7, 2015
Proponent response to reviewer comments on Draft WL due	Proponent	October 1, 2015 October 14, 2015
Deadline for Closing Arguments from Interveners Deadline for Closing Statements from Interveners	Interveners	October 8, 2015 October 20, 2015
Deadline for Closing Arguments from Proponent Deadline for Closing Statements from Proponent	Proponent	October 15, 2015 October 27, 2015
WL and RFD sent to GNWT-ENR Minister for approval	MVLWB staff	Early November, 2015
Final WL Decision from GNWT-ENR Minister	ENR Minister	Up to 90 days
Expiry of Water Licence		January 29, 2016

* MVLWB – Mackenzie Valley Land and Water Board; GNWT-ENR – Government of the Northwest Territories – Environment and Natural Resources; WL – Water Licence; RFD – Reasons for Decision

** Prepared by Board staff for discussion and comment by the parties.