



April 18, 2016

File: MV2005L2-0015

Ms. Sarah McLean  
Regulatory Specialist  
De Beers Canada Inc.  
Gahcho Kué Project  
Suite 300, 5120-49th St.  
YELLOWKNIFE NT X1A 1P8      Email: Sarah.McLean@debeersgroup.com

Dear Ms. McLean:

**Revision to Type A Water Licence – Annex A: Surveillance Network Program  
De Beers Canada Inc. – Gahcho Kué Project, NT**

The Mackenzie Valley Land and Water Board (the Board) met on April 18, 2016 and reviewed your request to revise the Surveillance Network Program annexed to Water Licence MV2005L2-0015. Attached is an updated Water Licence with revisions to Annex A: Surveillance Network Program in accordance with Part B, item 7.

The Board notes that the methods for estimating flow and volume at Surveillance Network Program Stations 11 through 14 must be reviewed if continuous seepage is observed at any of these Stations.

The full cooperation of De Beers Canada Inc. is anticipated and appreciated. If you have any questions or concerns, please contact Angela Love at (867) 766-7456 or email [angela.love@mvlwb.com](mailto:angela.love@mvlwb.com).

Yours sincerely,

A handwritten signature in black ink, appearing to read 'F. M. Adlem', is written over a light blue horizontal line.

Floyd Adlem  
MVLWB A/Chair

Copied to: Distribution List

Attachment:

- Revised Water Licence MV2005L2-0015
- Reasons for Decision



Mackenzie Valley Land and Water Board
Water Licence

Pursuant to the Mackenzie Valley Resource Management Act and Regulations, the Mackenzie Valley Land and Water Board, hereinafter referred to as the Board, hereby grants to:

De Beers Canada Inc.
(Licensee)

of Suite 300, 5120 - 49th Street, Yellowknife, Northwest Territories X1A 1P8
(Mailing Address)

hereinafter called the Licensee, the right to alter, divert, or otherwise use water subject to the restrictions and conditions contained in the Waters Act and Regulations made thereunder and subject to and in accordance with the conditions specified in this Licence.

Licence Number: MV2005L2-0015
Licence Type: A
Water Management Area: Northwest Territories 01
Location: 63°25'12.5" N, 109°06'13.7" W and 63°58'49.3" N, 110°17'59.7" W
Purpose: Water Use and Waste Disposal
Description: Gahcho Kué Project
Quantity of Water not to be exceeded: See Part D, items 2 and 3
Effective date of licence:
Expiry date of licence: September 30, 2028

This Licence issued and recorded at Yellowknife includes and is subject to the annexed conditions.

Chair
Witness

Mackenzie Valley Land and Water Board

Approved by
Minister of Environment and Natural Resources

**Type A Water Licence MV2005L2-0015  
De Beers Canada Inc. – Gahcho Kué Project**

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## Part A: Scope and Definitions

### 1. Scope

- a) This Licence entitles the Licensee to use Water and dispose of Waste for the purpose of constructing, operating, closing, and reclaiming the Gahcho Kué Project (the Project), a diamond mine located within the Kennady Lake watershed of the Kirk Lake basin, approximately 280 kilometers (km) northeast of Yellowknife, Northwest Territories (NWT). The scope of the Project is described in the Updated Project Description submitted on November 28, 2013, and the additional information submitted during the regulatory process, and includes the following:
- i. dykes and berms to facilitate the Drawdown of Kennady Lake;
  - ii. withdrawal and use of Water from Area 8 and Lake N11;
  - iii. controlled and regulated Drawdown of Kennady Lake Water to Lake N11 and Area 8 of Kennady Lake;
  - iv. operational Discharge of effluent from the Water Management Pond to Lake N11 and Area 8 of Kennady Lake;
  - v. Open Pit mining of the Hearne, 5034 and Tuzo kimberlite pipes;
  - vi. milling facilities and infrastructure;
  - vii. ore and low grade ore stockpiles;
  - viii. a Fine Processed Kimberlite Containment Facility;
  - ix. a Coarse Processed Kimberlite Containment Facility;
  - x. a West Mine Rock Pile;
  - xi. a South Mine Rock Pile;
  - xii. deposition of kimberlite and Waste Rock into the Hearne and 5034 Open Pits;
  - xiii. refilling of Kennady Lake;
  - xiv. a Water Management Pond;
  - xv. quarrying;
  - xvi. the existing exploration camp, winter access spur road camp, and a mining camp;
  - xvii. fuel, lubricant, and glycol storage facilities and laydown areas;
  - xviii. explosives storage facilities and use of explosives;
  - xix. a Landfarm;
  - xx. Construction and Operation of the winter access spur road; and
  - xxi. site facilities and infrastructure including but not limited to the Water supply facility, Sewage Treatment Plant, pipelines, incinerator, site roads, all-season airstrip and apron, power plant, electrical distribution, and material storage and sorting facilities.

- 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) Compliance with the terms and conditions of this Licence does not excuse the Licensee from its obligation to comply with the requirements of any applicable Federal, Territorial or municipal laws.

## 2. Definitions

**Acid Rock Drainage** - acidic Water, often with elevated sulphate concentrations, that occurs as a result of oxidation of sulphide minerals contained in rock or other materials that are exposed as a result of natural weathering processes, Construction or mining activities.

**Act** - the *Waters Act*.

**Action Level** - a predetermined qualitative or quantitative trigger which, if 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 by subsection 65(1) of the Act.

**Aquatic Effects Monitoring Program** - 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; and to identify additional impact mitigation measures to reduce or eliminate environmental effects.

**Area 8** - the eastern section of Kennady Lake, outside the Controlled Area, where no mining activities will occur.

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

**Coarse Processed Kimberlite Containment Facility** - the constructed facility designed to store material that is generally 0.25 mm to 6 mm in diameter, rejected from the process plant after the recoverable diamonds have been extracted.

**Collection Pond(s)** - containment structures used to collect Water and/or to settle solids suspended in Minewater in the Controlled Area of Kennady Lake that collects site runoff.

**Construction** - any activities undertaken to construct or build any components of, or associated with, the development of the Project, including any Construction activities undertaken during Operations and closure phases of the Project.

**Controlled Area** - the isolated subwatersheds within Kennady Lake watershed after dewatering and Drawdown, where mining activities will be undertaken and Water associated with mining activities will be managed. Specifically, areas 1 through 7.

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

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

**Drawdown** - the removal of Water from Kennady Lake. This excludes withdrawals from the Water Management Pond.

**Engagement Plan** - a document, developed in accordance with the Board's June 2013, or subsequent editions, *Engagement and Consultation Policy* and the *Engagement Guidelines for Applicants and Holders of Water Licences and Land Use Permits*, that clearly describes how, when, and which engagement activities will occur with an affected party during the life of the Project.

**Engineered Structure** - any structure or facility related to Water Use or the deposit of Waste that is normally designed and approved by a Professional Engineer, that are associated with the Construction, Operation, closure and Reclamation of the Project, including but not limited to, the dykes and berms, Fine Processed Kimberlite Containment Facility, Coarse Kimberlite Containment Facility, West Mine Rock Pile, South Mine Rock Pile, and the Landfarm.

**Environmental Impact Review** - the totality of the Mackenzie Valley Environmental Impact Review Board Public Registry, for Environmental Impact Review 0607-001, as established under the authority of Part 5 of the *Mackenzie Valley Resource Management Act* for this Licence application. This includes, without limiting the foregoing, all documents, records, and materials of any kind submitted to the Mackenzie Valley Environmental Impact Review Board Public Registry which are relevant to Water Licence Application MV2005L2-0015 made by De Beers Canada Inc.

**Fine Processed Kimberlite Containment Facility** - the constructed facility designated to store material that is generally less than 0.25 mm in diameter, rejected from the process plant after the recoverable diamonds have been extracted.

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

**Groundwater** - all Water below the ground surface.

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

**Landfarm** - the lined, Engineered Structure designed to contain and treat hydrocarbon contaminated materials.

**Licensee** - the holder of this Licence.

**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 that cannot be exceeded in any one (1) sample.

**Metal Leaching** - the release of metals and metalloids in leachate, Seepage or drainage from rock or other materials associated with the Project.

**Minister** - a duly appointed member of the Executive Council who is responsible for the *Waters Act* or the department responsible for administering that Act.

**Modification** - a change, other than an expansion, that does not alter the purpose or function of a structure.

**Non-Potentially Acid Generating (Non-PAG) Rock** - any rock that does not have the capability to produce acidic leachate, Seepage, or drainage, but may still be capable of producing near neutral pH Metal Leaching.

**Open Pit(s)** - the Hearne, Tuzo and 5034 pits created by the extraction of Overburden and Waste Rock to mine the kimberlite ore.

**Operations** - the activities which occur following the commencement of mining ore for milling in the process plant.

**Overburden** - the materials (i.e., lake-bottom sediments and till) that overlie the Waste Rock and kimberlite deposit.

**Potentially Acid Generating (PAG) Rock** - any rock that has the capability to produce acidic leachate, Seepage, or drainage

**Professional Engineer** - a person who is registered with the Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists in accordance with the *Engineering and Geoscience Professions Act*. S.N.W.T. 2006, V.16, or subsequent editions, as a Professional Engineer, and whose principal field of specialization is appropriate to address the components of the Project at hand.

**Project** - the Gahcho Kué diamond mine operation in its entirety as described in the Report of Environmental Impact Review 0607-001, dated October 22, 2013, and in the Updated Project Description and supporting materials submitted on November 28, 2013.

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

**Reclamation** - activities which facilitate the return of areas affected by the Project to viable and, wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment, human activities, and the surrounding environment.



**Reclamation Materials** - unconsolidated materials such as till, sand, gravel, soil, and peat, which have been removed to clear sites; Wastes such as Sewage sludge that are suitable for use in Reclamation; and Non-Potentially Acid Generating Rock.

**Regulations** - Regulations promulgated pursuant to section 63 of the Act.

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

**Response Plan** - is 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** - Water or Waste that drains through or escapes from any structure designed to contain, withhold, divert or retain Water or Waste.

**Sewage** - all toilet Waste and greywater.

**Sewage Treatment Plant** - the treatment plant that is designed to contain and treat Sewage.

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

**South Mine Rock Pile** - the structure designed to contain Waste Rock constructed immediately south of area 6.

**Spill Contingency Plan** - a document, developed in accordance with Indian and Northern Affairs Canada's April 2007, or subsequent editions, *Guidelines for Spill Contingency Planning*, that describes the set of procedures to be implemented to minimize the effects of a spill.

**Surveillance Network Program (SNP)** - the monitoring requirements detailed in Annex A of this Licence.

**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 historic experiences of a people, and adapts to social, economic, environmental, spiritual and political change.

**Unauthorized Discharge** - a Discharge or spill of any Water or Waste not authorized under this Licence.

**Waste** - Waste as defined in section 1 of the Act.

**Wastewater** - the Water that is generated by Project activities or originates on site and contains Waste and includes but is not limited to runoff, Seepage, or minewater.

**Waste Management Plan** - a document, developed in accordance with the Board's March 2011, or subsequent editions, *Guidelines for Developing a Waste Management Plan*, that describes the methods of Waste management from Waste generation to final disposal.

**Waste Rock** - all unprocessed rock materials that are produced as a result of the Project. This material has been referred to as "mine rock" during the Environmental Impact Review and in the application and supporting materials documents.

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

**Water Management Pond** - areas 3 and 5 of Kennady Lake after milling commences, where Wastewater will be collected and stored from various locations and sources within the Controlled Area.

**Water Supply Facilities** - the Water intake and associated infrastructure for the supply of Water for the Project.

**Water Use** - a use of Water as defined by 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.

**West Mine Rock Pile** - the structure designed to contain Waste Rock constructed within the catchment of the Water Management Pond in areas 3 and 5.

## 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 annually, in advance of any Water Use, in accordance with the Mackenzie Valley Land and Water Board's March 2013, or subsequent editions, *Water Use Fee Policy*.
3. All information submitted to the Board, as required by this Licence, shall:
  - a) Be in accordance with the Mackenzie Valley Land and Water Board's March 2012, or subsequent editions, *Document Submission Standards*; and
  - b) Include a section within each submission which identifies wherein the pertinent requirements of the Licence are addressed.
4. The Licensee shall operate in accordance with plans and 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.
5. The Licensee shall comply with the Schedules, which are annexed to and form part of this Licence, and any amendments to the Schedules as may be made from time to time by the Board.
6. The Licensee shall implement the Surveillance Network Program, which is annexed to and forms part of this Licence, and any amendment to the Surveillance Network Program as may be made from time to time by the Board.
7. The Schedules, the Surveillance Network Program, and any compliance dates specified in this Licence may be amended 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.
8. 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.
9. The Licensee shall post and maintain signs necessary to identify the Surveillance Network Program sites to the satisfaction of an Inspector.
10. Beginning March 31, 2015, and no later than every March 31 thereafter, the Licensee shall submit an **Annual Water Licence Report** to the Board, which shall be in accordance with Schedule 1, item 1.

11. Within ninety (90) days following issuance of this Licence, the Licensee shall submit a revised **Engagement Plan** to the Board for approval, in accordance with the Mackenzie Valley Land and Water Board's June 2013, or subsequent editions, *Engagement Guidelines for Applicants and Holders of Water Licences and Land Use Permits*.
12. The Licensee shall adhere to the approved Engagement Plan and shall annually review the Plan and make any necessary revisions to reflect changes in operations, 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.
13. The Licensee shall take every reasonable precaution to protect the environment from the effects of its licenced activities.
14. 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.

### **Part C: Conditions Applying to Security Deposits**

1. The Licensee shall post and maintain a security deposit in accordance with Schedule 2, item 1.
2. Upon request of the Board, the Licensee shall submit a revised 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 and Schedule 2 may be revised by the Board based on estimates of the current Project Reclamation liability referred to in Part C, item 2 or based on such other information as may become available to the Board.
4. If the amount of the security deposit is revised by the Board as described under Part C, item 3, the Licensee shall post the revised amount with the Minister within 90 days of the Board giving notice of the revised amount.
5. The Licensee shall submit a revised Project Reclamation liability estimate after Board approval of the Rock Placement Verification Program Report that is required in accordance with Part E, item 7, utilizing the most current version of RECLAIM or another method acceptable to the Board.

## **Part D: Conditions Applying to Water Use**

1. The Licensee may only obtain fresh Water from Area 8 or Lake N11, unless otherwise approved by the Board. Water will be withdrawn using the Water Supply Facilities, unless otherwise authorized in writing by an Inspector.
2. The annual quantity of fresh Water withdrawn shall not exceed the limits set out in Schedule 3, item 1.
3. The annual quantity of Water drawn down from Kennady Lake shall not exceed the limits set out in Schedule 3, item 2.
4. The Licensee may obtain Water for dust suppression, as follows:
  - a) For roads and pads inside the Controlled Area, Water may be sourced from the Water Management Pond;
  - b) For roads and pads outside the Controlled Area, Water may be sourced from the following:
    - i. Water Management Pond only if the Water meets the Effluent Quality Criteria established in Part G; or
    - ii. Area 8; or
    - iii. Lake N11; or
    - iv. as otherwise approved by the Board.
5. The Licensee shall construct and maintain the Water intake(s) with a fish screen designed to prevent impingement and/or entrainment of fish. The fish screen shall be in accordance with the detailed guidance referred to in Schedule 3, item 3.
6. In any single ice-covered season, total Water withdrawal from a single Water body outside the Controlled Area, shall not exceed 10% of the available Water volume of the Water body. The available Water volume will be calculated using the appropriate maximum expected ice thickness in accordance with the detailed guidance referred to in Schedule 3, item 4.

## 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 prevent escape of 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 Project development upon request from the Board.
6. Within sixty (60) days following issuance of this Licence, the Licensee shall submit a **Standard Operating Procedure** (SOP) to the Board for approval. The SOP shall describe in detail how PAG and Non-PAG rock will be identified, segregated, and handled for placement to minimize the potential for Acid Rock Drainage and Metal Leaching for all Waste Rock used in Construction, mining, and Reclamation activities. The SOP shall address the Construction and Operation phases of the Project. The Licensee shall not commence Construction until the Board has approved the SOP.
7. Upon commencement of Construction, the Licensee shall initiate a **Rock Placement Verification Program** in accordance with the requirements set out in Schedule 4, item 1, to assess the effectiveness of the SOP referred to in Part E, item 6. Within eighteen (18) months following issuance of this Licence, the Licensee shall submit a **Rock Placement Verification Program Report** that describes the results of the Program to the Board for approval.
8. The Licensee shall adhere to the approved SOP and shall annually review the SOP and make revisions to reflect any changes in operations or the results of the Rock Placement Verification Program, or as directed by the Board. The revised SOP 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 SOP.
9. A revised Rock Placement Verification Program shall be conducted, and a revised report submitted to the Board, upon request of the Board.

10. The Licensee shall only use Non-PAG material for Construction and Reclamation purposes. The criterion for defining Non-PAG is material with less than 0.1% total sulphur, unless otherwise approved by the Board. The Board may consider other criteria for Non-PAG material if the Licensee demonstrates to the Board's satisfaction that the Non-PAG criteria has minimal potential for Acid Rock Drainage and Metal Leaching, and the Licensee submits a revised Geochemical Characterization and Management Plan to reflect the new criteria. The revised Geochemical Characterization and Management Plan shall be approved by the Board prior to any changes to the Non-PAG criteria.
11. A minimum of sixty (60) days prior to the commencement of Construction of any Engineered Structures, the Licensee shall submit to the Board, the **Final Detailed Construction Plans**, in accordance with Schedule 4, item 2.
12. The Licensee shall ensure that the Engineered Structures identified in Part E, item 11, are constructed in accordance with the Final Detailed Construction Plan and the Board-approved SOP.
13. A minimum of ten (10) days prior to the commencement of Construction of the Engineered Structures identified in Part E, item 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.
14. Within ninety (90) days of the completion of the Construction of the Engineered Structures identified in Part E, item 11, the Licensee shall submit an **As-Built Report** which shall include as-built drawings of the structures, documentation of field decisions that deviate from the Final Detailed Construction Plan, and any data used to support these decisions to the Board.
15. The Licensee shall excavate and stockpile any potential Reclamation Materials from within the footprints of the camp infrastructure, roads, West Mine Rock Pile, South Mine Rock Pile, and Open Pits for eventual use during closure and Reclamation. The Licensee will ensure that Seepage and runoff from these materials is managed to prevent release of suspended sediments, Acid Rock Drainage and Metal Leaching to the Receiving Environment.



## **Part F: Conditions Applying to Modifications**

1. The Licensee may, without written approval from the Board, carry out Modifications to the Water Management Pond, the Sewage Treatment Plant, the processing plant facilities, and any Engineered Structures, 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 beginning 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 the completion of Modifications referred to in Part F, item 1, the Licensee shall provide as-built drawings stamped by a Professional Engineer to the Board.

## Part G: Conditions Applying to Water and Waste 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**

2. Within sixty (60) days following issuance of this Licence, the Licensee shall submit a **Waste Management Plan** to the Board for approval, in accordance with the Mackenzie Valley Land and Water Board's March 2011, or subsequent editions, *Guidelines for the Development of a Waste Management Plan*. The Plan shall address the Construction and Operation phases of the Project. The Licensee shall not commence Construction until the Board has approved the Plan.
3. Within sixty (60) days following issuance of this Licence, the Licensee shall submit a **Construction Water Management Plan** to the Board for approval. The Plan shall address dyke Construction and Drawdown phases of the Project, meet the objectives listed in Part G, item 1, and satisfy the requirements of Schedule 5, item 1. The Licensee shall not commence dyke Construction or Drawdown until the Board has approved the Plan.
4. A minimum of sixty (60) days prior to the commencement of milling, the Licensee shall submit an **Operational Water Management Plan** to the Board for approval. The Plan shall meet the objectives listed in Part G, item 1, and satisfy the requirements of Schedule 5, item 2. The Licensee shall not commence Discharge from the Water Management Pond until the Board has approved the Plan.
5. A minimum of sixty (60) days prior to the commencement of refilling Kennady Lake, the Licensee shall submit a **Closure Water Management Plan** to the Board for approval. The Plan shall meet the objectives listed in Part G, item 1 and satisfy the requirements of Schedule 5, item 3. The Licensee shall not commence refilling until the Board has approved the Plan.
6. Within six (6) months following issuance of this Licence, the Licensee shall submit a **Groundwater Monitoring Program** to the Board for approval. The Program shall meet the objectives listed in Part G, item 1, and satisfy the requirements of Schedule 5, item 4. The Program shall address the Construction and Operational phases of the Project.
7. The Licensee shall ensure that the Discharge rates do not cause the total (pumped and natural) flow rate at the outlets of Lake N11 and Area 8 to exceed the two-year (median) maximum daily flow rates at these outlets, as follows:
  - a) During Discharge to Lake N11, the total flow rate at the outlet of Lake N11 shall not exceed five hundred thousand (500,000) cubic meters per day ( $m^3/d$ );
  - b) During Discharge to Area 8, the total flow rate at the outlet of Area 8 (Stream K5) shall not exceed one hundred and thirty-five thousand (135,000) cubic meters per day ( $m^3/d$ ).

8. During Drawdown of Kennady Lake, winter Discharge into Lake N11 or Area 8 shall cease if the winter Discharge Action Levels in the approved Construction Water Management Plan (pursuant to Part G, item 3) are exceeded. The Licensee may recommence winter Discharge upon written authorization from an Inspector.
9. During Drawdown of Kennady Lake, Water Discharged to Lake N11 and Area 8 shall meet the following quality criteria at SNP stations 02 and 04, respectively:

Parameter	Maximum Average Concentration	Maximum Grab Concentration
Total Suspended Solids	15 mg/L	25 mg/L

mg/L = milligrams per litre.

If these criteria are exceeded, the Licensee shall stop Discharging and notify the Board and an Inspector within 24 hours. Further necessary corrective actions to mitigate the issue shall be taken, as outlined in the Water Management Plan.

10. Within four (4) months following the completion of Drawdown of Kennady Lake, the Licensee shall submit a **Drawdown Summary Report**, to the Board and an Inspector.
11. Within sixty (60) days following issuance of this Licence, the Licensee shall submit an **Erosion and Sediment Management Plan** to the Board for approval. The Plan shall meet the objectives listed in Part G, item 1, and satisfy the requirements of Schedule 5, item 5. The Plan shall address the Construction and Operation phases of the Project. The Licensee shall not commence Construction until the Board has approved the Plan.
12. Within sixty (60) days following issuance of this Licence, the Licensee shall submit an **Explosives Management Plan** to the Board for approval. The Plan shall meet the objectives listed in Part G, item 1, satisfy the requirements of Schedule 5, item 6, and describe how the Licensee will minimize nitrogen species (i.e., ammonia, nitrate, and nitrite) loading to the Receiving Environment. The Plan shall address the Construction and Operation phases of the Project. The Licensee shall not commence Construction until the Board has approved the Plan.
13. The Licensee shall adhere to the November 28, 2013 Draft Geochemical Characterization Plan, until a Geochemical Characterization and Management Plan is approved by the Board.

14. Within sixty (60) days following issuance of this Licence, the Licensee shall submit a **Geochemical Characterization and Management Plan** to the Board for approval. The Plan shall meet the objectives listed in Part G, item 1 and detail how the Licensee will geochemically classify and manage Waste Rock, coarse and fine processed kimberlite, ore, and other materials in order to minimize Acid Rock Drainage and Metal Leaching. The Plan shall also satisfy the requirements of Schedule 5, item 7 and be in conformity with the approved SOP required under Part E, items 6 and 8. The Plan shall address the Construction and Operation phases of the Project.
15. Within sixty (60) days following issuance of this Licence, the Licensee shall submit a **Dyke A Construction and Management Plan** to the Board for approval. This Plan shall meet the objectives listed in Part G, item 1, and satisfy the requirements of Schedule 5, item 8. This Plan shall address the Construction and Operation phases of the Project. The Licensee shall not commence Construction until the Board has approved the Plan.
16. All other dykes shall be addressed under the **Dyke Construction and Management Plan**, which shall be submitted to the Board for approval sixty (60) days prior to commencement of Construction of any dykes other than Dyke A. This Plan shall meet the objectives listed in Part G, item 1, and satisfy the requirements of Schedule 5, item 8. This Plan shall address the Construction and Operation phases of the Project. The Licensee shall not commence Construction of these remaining dykes until the Board has approved the Plan.
17. A minimum of ninety (90) days prior to the commencement of Construction of the South Mine Rock Pile, West Mine Rock Pile, the Fine Kimberlite Containment Facility and the Coarse Kimberlite Containment Facility, the Licensee shall submit a **Processed Kimberlite and Waste Rock Management Plan** to the Board for approval. The Plan shall meet the objectives in Part G, item 1 and satisfy the requirements of Schedule 5, item 9. The Plan shall address the Construction and Operation phases of the Project. The Licensee shall not commence Construction of the South Mine Rock Pile, West Mine Rock Pile, the Fine Kimberlite Containment Facility and the Coarse Kimberlite Containment Facility until the Board has approved the Plan.
18. The Licensee shall adhere to the approved Plans referred to in Part G, item 2 (Waste Management Plan); Part G, items 3, 4, and 5 (Water Management Plans); Part G, item 11 (Erosion and Sediment Management Plan); Part G, item 12 (Explosives Management Plan); Part G, item 14 (Geochemical Characterization and Management Plan); Part G, item 15 (Dyke A Construction and Management Plan); Part G, item 16 (Dyke Construction and Management Plan) and Part G, item 17 (Processed Kimberlite and Waste Rock Management Plan), and shall annually review the Plans and make any necessary revisions to reflect changes in operations, or as directed by the Board. Revised plans shall include a brief summary of the changes made, and shall be presented in a format consistent with the Mackenzie Valley Land and Water Board's *Standard Outline for Management Plans*. Revised Plans 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.

## **Operations of Structures and Facilities**

19. The Licensee shall construct, operate, and maintain the South Mine Rock Pile, West Mine Rock Pile, the Fine Kimberlite Containment Facility, and the Coarse Kimberlite Containment Facility, and all other Waste storage facilities, to design specifications/engineering standards such that:
  - a) Any Seepage from the Waste storage facilities that occurs and does not meet effluent quality requirements, as specified in Part G, items 27, 30 and 31, shall be prevented from entering the Receiving Environment;
  - b) Any constructed facilities that are eroded are repaired immediately;
  - c) Monitoring of the Waste storage facilities is sufficient to ensure that:
    - i. Performance design criteria, as described in the Final Detailed Construction Plan documents referred to in Part E, items 11 and 12, are being met;
    - ii. Changes in management of the Waste storage facilities, including any necessary additional mitigations are identified; and
    - iii. Material will be handled and stored within the Controlled Area based on its PAG or Non-PAG status, as characterized by geochemical testing as defined in the Geochemical Characterization and Management Plan.
  - d) Conditions for eventual closure and Reclamation of the Waste storage facilities are optimized; and
  - e) Procedures are in place to ensure that the Licensee will take appropriate actions if Action Levels, as defined in the Processed Kimberlite and Waste Rock Management Plan, are exceeded.
  
20. The Licensee shall construct, operate, and maintain the Water Management Pond to specifications such that:
  - a) A minimum Freeboard limit of 1.0 meter (m) shall be maintained at all times or any other Freeboard limit as recommended by a Professional Engineer and as approved by the Board;
  - b) Seepage from the Water Management Pond to the Receiving Environment is minimized at all times;
  - c) Any Seepage from the Water Management Pond that occurs and does not meet effluent quality requirements, as specified in Part G, items 30 and 31, shall be prevented from entering the Receiving Environment;
  - d) Any constructed facilities that are eroded are repaired immediately;
  - e) Conditions for eventual closure and Reclamation of the Water Management Pond are optimized; and
  - f) The Licensee will take appropriate actions if Action Levels, as defined in the Water Management Plan, are exceeded.

## Inspections of Structures and Facilities

21. The Licensee shall conduct daily erosion inspections of Discharge points during periods of Discharge, or more frequently as directed by an Inspector. Records of these inspections shall be kept for review upon request of an Inspector.
22. The Licensee shall conduct weekly inspections of the Engineered Structures, ore stockpile areas, road fill, pits, pipelines, and airstrip when operating, or more frequently as directed by an Inspector. Records of these inspections shall be kept for review upon request of an Inspector.
23. The Licensee shall ensure that geotechnical inspections of the Engineered Structures, ore stockpile areas, road fill, pits, and airstrip 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). The Licensee shall:
  - a) Provide written notification to an Inspector a minimum of two (2) weeks prior to the Professional Engineer's annual inspections; and,
  - b) Within ninety (90) 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.
24. The Licensee shall ensure that geochemical inspections of the Engineered Structures, ore stockpile areas, road fill, pits, and airstrip are in conformance with the approved Geochemical Characterization and Management Plan.
25. The Licensee shall conduct a **Dam Safety Review** of the dykes within the first three (3) years after commencing Construction, and every seven (7) 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 Professional Engineer. The Dam Safety Review may be conducted during the year at the discretion of a Professional Engineer. Within ninety (90) days of completing the Dam Safety Review, the Licensee shall submit the Professional Engineer's **Dam Safety 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.

**Effluent Quality Criteria - Sewage**

- 26. The Licensee shall direct all piped and pumped Sewage to the Sewage Treatment Plant, or as otherwise approved by the Board.
- 27. Effluent from the Sewage Treatment Plant at SNP station 07 shall meet the following effluent quality criteria:

<b>Parameter</b>	<b>Maximum Grab Concentration</b>
Faecal Coliforms	20 CFU/100mL

CFU = Colony Forming Units

**Effluent Quality Criteria - Lake N11 and Area 8**

- 28. All Wastewater to be Discharged to the Receiving Environment shall be directed to the Water Management Pond, or any other location as otherwise approved by the Board.
- 29. The Licensee shall provide Water sampling results from SNP station 02 and 04 to an Inspector no later than five (5) days prior to any planned Discharge of Wastewater from the Water Management Pond to the Receiving Environment. Discharge shall not commence until authorized in writing by an Inspector.
- 30. Discharges from the Water Management Pond to Lake N11 shall meet the following EQC at SNP station 02:

<b>Parameters</b>	<b>Maximum Average Concentration (in mg/L)</b>	<b>Maximum Grab Concentration (in mg/L)</b>
Ammonia as N	10	20
Sulphate	150	300
Nitrate as N	10	20
Total Phosphorus	0.03	0.06
Chloride	160	320
Fluoride	0.15	0.3
Total Aluminum	0.1	0.2
Total Chromium	0.002	0.004
Total Copper	0.003	0.006
Total Iron	0.4	0.8
Total Molybdenum	0.3	0.6

Total Nickel	0.09	0.18
Total Uranium	0.06	0.12
Total Suspended Solids	15	25
Total Petroleum Hydrocarbons	-	5

mg/L = milligrams per litre

Any Water or Waste from the Project that enters the Receiving Environment at SNP 02 shall have a pH between 6.5 and 9.0.

31. Discharges from the Water Management Pond to Area 8 shall meet the following EQC at SNP station 04:

<b>Parameters</b>	<b>Maximum Average Concentration in mg/L</b>	<b>Maximum Grab Concentration in mg/L</b>
Ammonia as N	7	14
Sulphate	70	140
Nitrate as N	3.5	7
Total Phosphorus	0.012	0.024
Total Chromium	0.001	0.002
Total Molybdenum	0.09	0.18
Total Nickel	0.02	0.04
Total Uranium	0.02	0.04
Total Dissolved Solids	110	220
Total Suspended Sediments	6	12
Total Petroleum Hydrocarbons	-	5

mg/L = milligrams per litre

Any Water or Waste from the Project that enters the Receiving Environment at SNP 04 shall have a pH between 6.5 and 9.0.



32. If the EQCs as listed in Part G, items 30 and 31 are exceeded, the Licensee shall cease all Discharge from the Water Management Pond to Lake N11 and/or Area 8, shall notify the Board and an Inspector, and shall take the necessary corrective action to mitigate the exceedance, as outlined in the Water Management Plan, to the satisfaction of an Inspector immediately.
33. Water or Waste from the Project that enters the Receiving Environment, including Discharges from SNP station 02 and 04, shall not be acutely toxic as determined by the acute toxicity tests described in Part B of the attached Surveillance Network Program.
34. If the Licensee proposes to continue Discharge to Lake N11 for more than three (3) years following the establishment of the Water Management Pond, or to Area 8 for more than one (1) year following the establishment of the Water Management Pond, the Licensee shall submit an **EQC Evaluation Report** to the Board for approval six (6) months prior to the proposed continuation of Discharge. The objective of the report is to evaluate whether the EQC in Part G, items 30 and 31 will continue to ensure that water quality objectives in the Receiving Environment are maintained if Discharge continues to Area 8 or Lake N11 beyond one (1) or three (3) years following the establishment of the Water Management Pond, respectively.

## Part H: Conditions Applying to Contingency Planning

1. Within sixty (60) days following issuance of this Licence, the Licensee shall submit a **Spill Contingency Plan** to the Board for approval, in accordance with Indian and Northern Affairs Canada's 2007, or subsequent editions, *Guidelines for Spill Contingency Planning*. The Licensee shall not commence Construction or Drawdown until the Board has approved the Plan.
2. The Licensee shall adhere to 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.
3. If, during the period of this Licence, a spill or an Unauthorized Discharge 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; and
  - 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 within thirty (30) days.
4. All spills and Unauthorized Discharges of Water or Waste shall be reclaimed to the satisfaction of an Inspector.

## Part I: Conditions Applying to Aquatic Effects Monitoring

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 the Environmental Impact Review and in other submissions to the Board regarding the impacts of the Project on the Receiving Environment;
  - c) To evaluate whether traditional Water Uses in Lake N11 (outside of the initial dilution zone) and in all Waters downstream of Kennady Lake are affected by the Project's activities throughout Construction, Operation, and Reclamation;
  - d) To assess the effectiveness of mitigation measures that are used to minimize the effects of the Project on the Receiving Environment;
  - e) To identify whether there is any need for additional mitigation measures to reduce or eliminate Project-related effects; and
  - f) 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 adhere to the **AEMP Design Plan** submitted June 26, 2014, until a Plan is approved by the Board.
3. The Licensee shall implement the AEMP Design Plan referred to in Part I, 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 a revised AEMP Design Plan to the Board for approval on September 30, 2019, and every three (3) years thereafter, or as directed by the Board. The AEMP Design Plan shall satisfy the requirements of Schedule 6, item 1.
5. The Licensee shall submit an **Aquatic Effects Re-evaluation Report** for Board approval by July 31, 2019 and every three (3) years thereafter that meets the following objectives and satisfy the requirements of Schedule 6, item 2:
  - a) To describe the Project-related effects on the Receiving Environment as measured from Project inception and compared against predictions made in Environmental Impact Review and in other submissions to the Board;
  - 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. On or before May 1 each year, the Licensee shall submit an **AEMP Annual Report** to the Board for approval. This Report shall satisfy the requirements of Schedule 6, 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, submit an **AEMP Response Plan** that satisfies the requirements of Schedule 6, item 4 to the Board for approval.
8. The Licensee shall implement the AEMP Response Plan as and when approved by the Board.
9. The Licensee shall submit a revised AEMP Response Plan as directed by the Board.
10. 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.

## Part J: Conditions Applying to Closure and Reclamation

1. Within twenty four (24) months following issuance of this Licence, the Licensee shall submit an **Interim Closure and Reclamation Plan** to the Board for approval, in accordance with the Mackenzie Valley Land and Water Board and Aboriginal Affairs and Northern Development Canada's November 2013, or subsequent editions, *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories*. In addition to conforming with the Guidelines, the Licensee shall:
  - a) Propose methods to reduce the period of time required for the recovery of the Water Management Pond;
  - b) Include a research plan for investigating cover options for the Waste Rock piles and processed kimberlite; and
  - c) Include any implications the results of the Rock Placement Verification Program required under Part E, item 7 have on Waste Rock handling and closure and Reclamation options.
2. The Licensee shall implement 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. The Licensee shall submit a revised Interim Closure and Reclamation Plan upon request of the Board.
4. Beginning March 31, 2016, and no later than every March 31 thereafter, the Licensee shall submit an **Annual Closure and Reclamation Plan Progress Report** to the Board, which shall be in accordance with the Guidelines referred to in Part J, item 1 and any other information requested by the Board.
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.
6. The Licensee shall implement the Final Closure and Reclamation Plan as approved by the Board.
7. The Licensee shall submit a revised Final Closure and Reclamation Plan upon request of the Board.

Signed on behalf of the Mackenzie Valley Land and Water Board



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**A/Chair**  
**Floyd Adlem**



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**Witness,**  
**Amanda Gauthier**

**Schedules**  
**Attached to Water Licence MV2005L2-0015**  
**De Beers Canada Inc. – Gahcho Kué Project**

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## Schedule 1

### Part B, item 10 – Annual Water Licence Report

1. The **Annual Water Licence Report** referred to in Part B, item 10 of this Licence shall include, but not be limited to, the following:

#### **Management Plans and Activities**

- a) A summary of engagement activities conducted in accordance with the approved **Engagement Plan**, in Part B, item 11 of this Licence, undertaken during the previous calendar year and shall include a brief description of activities planned for the forthcoming year;
- b) A summary of Construction and Project activities, including work carried out under the approved **Dyke A Construction and Management Plan** and **Dyke Construction and Management Plan**, conducted in accordance with Parts E and G of this Licence, undertaken during the previous year calendar year;
- c) An updated Project schedule;
- d) A summary of **Modification** activities conducted in accordance with Part F of this Licence, undertaken during the previous calendar year;
- e) A summary of activities conducted in accordance with the approved **Waste Management Plan**, required in Part G, item 2 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 and Wastewater;
- f) A summary of activities conducted in accordance with the approved **Water Management Plan**, relevant to the appropriate phase of the Project and as required in Part G, items 3, 4, and 5 of this Licence, undertaken during the previous calendar year, including:
  - i. A summary of updates or changes to the process or facilities, including Drawdown activities, required for the management of Water and Wastewater;
  - ii. The monthly and annual quantities in cubic meters (m<sup>3</sup>) of Water obtained from Area 8;
  - iii. The monthly and annual quantities in cubic meters (m<sup>3</sup>) of Water obtained for downstream flow mitigation in Area 8, identified by source location;
  - iv. During Drawdown of Kennady Lake, the monthly and annual quantities in cubic meters (m<sup>3</sup>) of all Water Discharged from Kennady Lake to each Discharge location;
  - v. During Discharge from the Water Management Pond, the monthly and annual quantities of Discharge from the Water Management Pond to each Discharge location (Lake N11 and Area 8) when Discharge is occurring;
  - vi. A comparison of Water and Wastewater quantities measured in the year to the Water balances predicted for that year in the approved Water Management Plan, and an explanation of any significant differences between predictions and actual measurements;
  - vii. Monthly elevations of Water in the Water Management Pond, areas 4, 6 and 7, Lakes A1, D2 and D3, and E1, including stage volume curves for each of these waterbodies;
  - viii. Monthly and annual quantities in cubic meters (m<sup>3</sup>) of Water pumped from each Open Pit and Collection Pond, identifying the Discharge location;

- ix. Monthly and annual quantities in cubic meters (m<sup>3</sup>) of Water Discharged from each Waste Rock pile;
  - x. Monthly and annual quantities in cubic meters (m<sup>3</sup>) of Water discharging from the processed kimberlite disposal facilities;
  - xi. Monthly and annual estimates and measurements of precipitation and runoff;
  - xii. Monthly and annual amount of Water used for dust control;
  - xiii. A summary and interpretation of monitoring results, including any Action Level exceedances described in the approved Water Management Plan;
  - 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 Water Management Plan.
- g) A summary of activities conducted in accordance with the approved **Groundwater Monitoring Program**, required in Part G, item 6 of this Licence, undertaken during the previous calendar year, including:
- i. A summary and interpretation of monitoring results, including an evaluation of trends in Open Pit inflow quantity and quality;
  - ii. A comparison of monitoring results to predictions of Open Pit inflow quantity and quality, with an explanation for any significant differences;
  - iii. A description of any updates to predictions;
  - iv. An assessment of the effects of Open Pit development on Groundwater movement and quality;
  - v. A summary of any Action Level exceedances under the Groundwater Monitoring Program; and
  - vi. A description of actions taken in response to Action Level exceedances.
- h) A summary of activities conducted in accordance with the approved **Erosion and Sediment Management Plan**, required in Part G, item 11 of this Licence, undertaken during the previous calendar year including:
- 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.
- i) A summary of activities conducted in accordance with the approved **Explosives Management Plan**, required in Part G, item 12 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;
- j) A summary of results of any monitoring and the Seepage surveys conducted in accordance with the approved **Geochemical Characterization and Management Plan**, required in Part G, item 14 of this Licence, undertaken during the previous calendar year, including:
- i. A comparison of the annual quantities of the different types of Waste Rock generated to predictions made in the approved Geochemical Characterization and Management Plan;
  - ii. A summary and interpretation of results from the geochemical monitoring required as per Schedule 5, item 7, including analysis results of any Seepage with runoff inputs to the Water Management Pond as well as any outside of the Controlled Area. Results shall be compared to appropriate reference locations in unaffected areas;



- iii. An overview analysis of major trends, site plans indicating the locations of Seepage, and summary of recommendations for future Seepage monitoring or management actions;
  - iv. An interpretation of the results of all survey data collected since Project inception with site plans indicating the locations of Seepage and the quality assurance and quality control procedures used;
  - v. A summary of results from investigations or activities related to field test cells;
  - vi. A summary and interpretation of Water quality monitoring results for each of the main source areas (Waste Rock piles, Open Pits, camp pad, and airstrip) and how these compare to predicted values;
  - vii. A summary of any exceedances of the Action Levels described in the Geochemical Characterization and Management Plan;
  - viii. A description of actions taken in response to any Action Level exceedances under the Geochemical Characterization and Management Plan; and
  - ix. Any geochemical inspections reports from the preceding year, as appendices to the Annual Water Licence Report.
- k) A summary of activities conducted in accordance with the approved **Processed Kimberlite and Waste Rock Management Plan**, required in Part G, item 17 of this Licence, undertaken during the previous calendar year, including:
- i. A summary of updates or changes to the process or facilities required for the management of Processed Kimberlite, Waste Rock, and Overburden;
  - ii. The monthly and annual quantities in cubic meters (m<sup>3</sup>) and tonnes (t) of Overburden removed from each Open Pit and its deposition location;
  - iii. The monthly and annual quantities in cubic meters (m<sup>3</sup>) and tonnes (t) of Waste Rock placed in the South Mine Rock Pile and the West Mine Rock Pile, identifying the classification of quantities of each rock type, geochemical classification and its disposal location;
  - iv. The monthly and annual quantities in cubic meters (m<sup>3</sup>) of Waste Rock placed for Construction activities, including an updated map or diagram showing the location and Waste Rock classification of the deposited materials;
  - v. The monthly and annual quantities in cubic meters (m<sup>3</sup>) of Waste Rock placed in the 5034 Open Pit and the Hearne Open Pit; including an updated map or diagram showing the location and Waste Rock classification of the deposited materials;
  - vi. The monthly and annual quantities in cubic meters (m<sup>3</sup>) and tonnes (t) of Processed Kimberlite placed in each of the Coarse Processed Kimberlite Containment Facility, the Fine Processed Kimberlite Containment Facility, the 5034 Open Pit and the Hearne Open Pit;
  - vii. The monthly and annual quantities in cubic meters (m<sup>3</sup>) and tonnes (t) of slurry deposited in each of the Fine Processed Kimberlite Containment Facility and the Hearne and 5034 Open Pits;
  - viii. The monthly, annual and cumulative quantities in cubic meters (m<sup>3</sup>) and tonnes (t), and locations of any Overburden, Processed Kimberlite, Waste Rock or ore stockpiles;
  - ix. The annual quantities in cubic meters (m<sup>3</sup>) and tonnes (t) of other solid Waste, placed in each of the South Mine Rock Pile and West Mine Rock Pile;
  - x. A summary and interpretation of monitoring results, including any Action Level exceedances; and

- xi. A description of actions taken in response to any Action Level exceedances.
- l) A summary of activities conducted in accordance with the approved **Spill Contingency Plan**, required in Part H, item 1 of this Licence, undertaken during the previous calendar year, including:
  - 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; and
  - ii. An outline of any spill training and communications exercises carried out during the previous calendar year.

#### **Other Reporting Requirements**

- m) A progress report on any studies or plans, including **Aquatic Effects Monitoring Program Response Plans** and any **Reclamation Research Plans**, 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 30 of the year being reported;
- o) A summary of the activities carried out to implement measures and follow-up programs to address Water Use and protection of Water quality as identified by the Minister in the Report of Environmental Impact Review 0607-001;
- p) A table detailing all commitments made during Environmental Impact Review 0607-001 and the subsequent regulatory processes, with descriptions of how each commitment is being, or has been, met;
- q) A summary of the calibration and status of the meters and devices referred to in Part B, item 8 of this Licence;
- r) Tabular summaries of all data and information generated 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 sites 02 and 04), in excel or an electronic and printed format acceptable to the Board. The Licensee shall provide raw data in electronic form to the Board;
- s) A list of submissions made to the Board during the previous calendar year; and
- t) A summary of actions taken to address concerns, non-conformances, or deficiencies in any reports filed by an Inspector.

## Schedule 2

### Part C, item 1: Security Deposits

1. Pursuant to section 35 of the Act and section 11 of the Waters Regulations, the Licensee shall post security totaling \$67,148,612 based on the schedule set out below:
  - a) Prior to the commencement of Construction, the Licensee shall post and maintain a security deposit of \$3,613,466;
  - b) One year following the date the security was posted under Schedule 2, item 1(a) the Licensee shall post an additional security deposit in the amount of \$3,613,465 to maintain a total security deposit of \$7,226,931;
  - c) Prior to Year 1 of Operations, the Licensee shall post an additional security deposit in the amount of \$16,549,339 to maintain a total security deposit of \$23,776,270;
  - d) Prior to Year 4 of Operations, the Licensee shall post an additional security deposit in the amount of \$40,713,234 to maintain a total security deposit of \$64,489,504;
  - e) Prior to Year 7 of Operations, the Licensee shall post an additional security deposit in the amount of \$1,559,554 to maintain a total security deposit of \$66,049,058; and
  - f) Prior to Year 11 of Operations, the Licensee shall post an additional security deposit in the amount of \$1,099,554 to maintain a total security deposit of \$67,148,612.

## Schedule 3

### Part D: Water Use

1. The annual quantity of fresh Water withdrawn referred to in Part D, item 2 of this Licence shall not exceed the following:
  - a) 60,000 (sixty thousand) cubic meters (m<sup>3</sup>) annually, during the operational phase of Construction;
  - b) 27,000 (twenty-seven thousand) cubic meters (m<sup>3</sup>) annually, during the operational phase of Operations; and
  - c) 1,555,200 (one million, five hundred and fifty five thousand, two hundred) cubic meters (m<sup>3</sup>) per year for every three out of four years for downstream flow mitigation.
2. The annual quantity of Water drawn down from Kennady Lake as referred to in Part D, item 3 of this licence shall not exceed the following:
  - a) 18,650,000 (eighteen million, six hundred and fifty thousand) cubic meters (m<sup>3</sup>) during the first year of Drawdown of Kennady Lake; and
  - b) 3,450,000 (three million, four hundred and fifty thousand) cubic meters (m<sup>3</sup>) during the subsequent year(s) of Drawdown of Kennady Lake.
3. 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 subsequent editions, and *Fish Screen Design Criteria for Flood and Water Truck Pumps, 2011*, or subsequent editions.
4. The Licensee shall adhere to the best practices outlined in the *Department of Fisheries and Oceans' Protocol for Winter Water-Withdrawal from Ice-Covered Waterbodies in the NWT and NU*.

## Schedule 4

### Part E: Construction

1. **Rock Placement Verification Program** referred to in Part E, item 7 of this Licence that describes the verification process for the rock placement strategy as detailed in the SOP (required under Part E, items 6 and 8 of this Licence) shall include, but not be limited to, the following information:
  - a) Verification and/or required Modification of PAG identification sampling frequency of 8 samples per one hundred thousand (100,000) tonnes (t):
    - i. A focused sampling and testing program at a higher frequency (e.g. every blast hole) to assess if the proposed sample frequency adequately isolates PAG zones from Non-PAG zones; and
    - ii. The development of a sulphide block model to enable spatial prediction of sulphide zones.
  - b) Verification of success of isolating Non-PAG Rock for use in construction:
    - i. Sampling and characterization of construction rock after placement to ensure that rock placement has been conducted as intended.
  - c) Verification of success of PAG segregation and placement:
    - i. Sampling and characterization of Waste Rock after placement (both in PAG zones and Non-PAG zones) to ensure that rock placement has been conducted as intended.
2. **Final Detailed Construction Plans** referred to in Part E, item 11 of this Licence shall include, but not be limited to, the following information:
  - a) A description of the facilities to be constructed, including proposed locations;
  - 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 facilities, beneath the footprint of all containment and 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) Operations and maintenance requirements;
  - h) Detailed instrumentation and monitoring plans, including but not limited to sampling locations, parameters measured, and frequencies of sampling to be carried out; and
  - i) 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.

## Schedule 5

### Part G: Water and Waste Management

1. The **Construction Water Management Plan** referred to in Part G, item 3 of this Licence shall include, but not be limited to, the following:
  - a) Information regarding Water and Wastewater management:
    - i. A description of the process and facilities for the management of Sewage.
  - b) Information applicable to Drawdown activities:
    - i. A schedule for Drawdown, including daily flow rates;
    - ii. Pumping methods including locations of intake and outflow structures;
    - iii. A description for how and where flow will be continuously monitored;
    - iv. The design of any erosion prevention structures, where required, in the areas where Water is Discharged or where there is potential for erosion to occur;
    - v. The procedures for inspecting any erosion along the affected watercourse(s);
    - vi. The design of the pipeline, diffusers, and related facilities, with appropriate maps or diagrams of the components; and
    - vii. Any other information required to describe how Water and Wastewater will be managed such that the objectives listed in Part G, item 1 of this Licence are achieved.
  - c) Information regarding monitoring activities including:
    - i. Parameters, locations and frequency of the monitoring necessary to continuously adjust Drawdown flow rates with the purpose of minimizing effects to the Receiving Environment. Monitoring shall include but not be limited to:
      - a. The measurement of flow rates in downstream areas and lake Water levels; and
      - b. In winter, monitoring should also include measurements of outlet channel ice levels and surface flow conditions.
    - ii. Locations and frequency for monitoring turbidity and TSS during Drawdown;
    - iii. A description of how the relationship between turbidity and TSS will be established and verified;
    - iv. Linkages to other monitoring programs required in this Licence; and
    - v. Any other information about the monitoring that will be performed to meet the objectives in Part G, item 1 of this Licence.

d) Information about 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 monitoring identified in Schedule 5, item 1(c). At a minimum, Action Levels should be set that define downstream conditions at which winter Discharge should cease as per Part G, item 8 of this Licence; 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 10 of this Licence and Schedule 1, item 1.

2. The **Operational Water Management Plan** referred to in Part G, item 4 of this Licence shall include, but not be limited to, the following:

a) Information regarding Water and Wastewater management:

- i. A summary, with appropriate maps or diagrams, of the components of the Water management system and all the Water and Wastewater streams that report to and from it;
- ii. A description of the process and facilities intended for the purposes of:
  - a. Obtaining fresh Water from Area 8/Kennady Lake for use at the Project;
  - b. Obtaining fresh Water from Lake N11 (or adjacent lake) for use to supplement downstream flows in Area 8;
  - c. The collection and management of surface runoff from the Project;
  - d. The collection and management of any Wastewater resulting from the Project;
  - e. The management of Sewage;
- iii. A description of when the Water balance will be recalculated; and
- iv. Any other information required to describe how Water and Wastewater will be managed such that the objectives listed in Part G, item 1 of this Licence are achieved.

b) Information regarding monitoring activities including:

- i. Details of monitoring, including a rationale for each component of the Water management system;
- ii. Linkages to other monitoring programs required in this Licence; and
- iii. Any other information about the monitoring that will be performed to meet the objectives in Part G, item 1 of this Licence.

c) Information about 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 Water Management Pond with respect to geotechnical stability, thermal characteristics, Seepage quality and quantity, and runoff; 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 10 of this Licence and Schedule 1, item 1.

3. The **Closure Water Management Plan** referred to in Part G, item 5 of this Licence shall include, but not be limited to, the following:

a) Information regarding Water and Wastewater management:

- i. A summary, with appropriate maps or diagrams, of the components of the Water management system and all the Water and Wastewater streams that report to and from it;
- ii. A description of the process and facilities intended for the purposes of:
  - a. Obtaining fresh Water from Area 8/Kennady Lake for use at the Project;
  - b. Obtaining fresh Water from Lake N11 (or adjacent lake) for use to supplement downstream flows in Area 8;
  - c. Collecting and managing surface runoff from the Project;
  - d. Collecting and managing any Wastewater resulting from the Project;
  - e. Refilling of Kennady Lake;
  - f. Management of Sewage;
  - g. Maintaining downstream flow mitigation of during the refilling of Kennady Lake
  - h. Reconnecting site-wide drainage patterns; and
  - i. Reconnecting downstream watersheds.
- iii. A description of when the Water balance will be recalculated; and
- iv. Any other information required to describe how Water and Wastewater will be managed such that the objectives listed in Part G, item 1 of this Licence are achieved.

b) Information regarding monitoring activities including:

- i. Details of monitoring, including a rationale for each component of the Water management system during closure and Reclamation;
- ii. Linkages to other monitoring programs required in this Licence; and
- iii. Any other information about the monitoring that will be performed to meet the objectives in the approved Final Closure and Reclamation Plan as referred to in Part J, item 5 of this Licence.



- c) Information about 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 closure objectives identified in the Final Closure and Reclamation Plan (Part J, item 5 of this Licence) and the objectives in Part G, item 1 of this Licence are met. This description shall include:
    - a. Definitions, with rationale, for Action Levels applicable to the performance of the Water Management Pond during closure and Reclamation; 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 by the Licensee if Action Levels are 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 10 of this Licence and Schedule 1, item 1.
- 4. The **Groundwater Monitoring Program** referred to in Part G, item 6 of this Licence shall include, but not be limited to the following information:
  - a) Information regarding monitoring activities:
    - i. Description of the site hydrogeology and a summary of baseline monitoring information;
    - ii. Groundwater flow diagrams illustrating the distribution and movement of Groundwater;
    - iii. A description of the monitoring of quality and quantity of total inflow into the Open Pits; and
    - iv. A description of the Seepage surveys that will be conducted in the Open Pits during mining, flooding, and backfilling;
  - b) Information about monitoring results:
    - i. A description of how the results of the Open Pit inflow monitoring and Seepage survey results will be compared to pit inflow quality and quantity predictions, the Groundwater flow model, and the hydrogeological model for the site and used to update predictions as required; and
    - ii. A description of how the results of the Open Pit inflow monitoring and Seepage survey results will be used to assess the effects of pit development on Groundwater movement and quality;

- c) Information about 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 quantity and quality of Open Pit inflows; 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 Level 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 10 of this Licence and Schedule 1, item 1.

5. The **Erosion and Sediment Management Plan** referred to in Part G, item 11 of this Licence shall include, but not be limited to, the following:

- a) Information regarding erosion and sediment control methodologies:
  - i. A summary, with appropriate maps or diagrams, of the Project site 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 Project activities and for different levels of assessed risk;
  - iv. Any other information required to describe how erosion and sediment release into the Receiving Environment will be minimized.
- b) Information about monitoring including:
  - i. Details for monitoring, including rationale, that will be undertaken with respect to erosion and sediment control during all phases of the Project include Construction, Operations, and closure;
  - ii. Linkages to other monitoring programs required in this Licence; and
  - iii. Any other information about monitoring that will be performed to meet the objectives in Part G, item 1 of this Licence.
- c) Information about responses to monitoring results:
  - i. A description of how the monitoring information will be assessed and generally what types of actions will be taken in response to the monitoring results.

6. The **Explosives Management Plan** referred to in Part G, item 12 of this Licence shall include, but not be limited to, the following:
  - a) The predicted ammonium nitrate dissolution rate;
  - b) Identification of mitigation approaches to be employed with respect to storage, handling, blasting and spills;
  - c) Description of the monitoring required to evaluate whether the mitigation approaches for storage, handling, and blasting procedures are effective, with rationale, for Action Levels applicable to the performance of the plan; for each Action Level, a description of how exceedances of the Action Level will be assessed and generally which types of action will be taken of the Action Level is exceeded; and
  - d) A summary of the actions in items (a) through (c) above, including any Action Level exceedances shall be reported in the Annual Water Licence Report as per Part B, item 10 of this Licence and Schedule 1, item 1.
  
7. The **Geochemical Characterization and Management Plan** referred to in Part G, item 14 of this Licence shall include, but is not limited to, the following:
  - a) A summary of findings from previous geochemical characterization (Acid Rock Drainage/Metal Leaching potential) on the Waste Rock, Fine and Coarse Processed Kimberlite, and Overburden including references and weblinks to previous reports;
  - b) Criteria for defining PAG materials;
  - c) Updated production schedules showing estimated volumes and tonnages of Waste Rock, Fine and Coarse Processed Kimberlite, and Overburden that will be produced each year over the duration of the Project;
  - d) Details on the geochemical characterization of Overburden that will be used in Construction or for Reclamation, including specific measures to ensure that this material meets or exceeds the geochemical cutoff criteria defined for Non-PAG;
  - e) Information regarding geochemical inspections and supplemental monitoring program, including:
    - i. Details on the geochemical site inspection, including visual inspections, and supplemental sampling and testing on each type of Waste Rock, Fine and Coarse Processed Kimberlite, and Overburden material;
    - ii. Details on sampling and analysis of any Seepage with runoff inputs to the Water Management Pond as well as any outside of the Controlled Area (including SNP stations 11-17), following the sampling frequency and sampling parameters defined for SNP stations 11-17 and including appropriate reference locations in unaffected areas to compare results.
    - iii. Details on monitoring of the field test cells, including sampling frequency, field measurements and analytical parameters;
    - iv. A description of the process that would be followed to change the proposed monitoring program, recognizing that any changes would require approval by the Board;
    - v. Linkages to other monitoring programs required in this Licence; and
    - vi. Any other information about the monitoring that will be performed to meet the objective in Part G, items 1 and 14 of this Licence.

- f) Information regarding contingencies and 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 objectives listed in Part G, item 1 of this Licence are met. This description shall include:
    - a. Definitions, with rationale for Action Levels applicable to the performance of the Geochemical Characterization and Management Plan with respect to geochemical stability as well as Seepage and runoff quality and quantity; 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 by the Licensee if the Action Level is 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 10 of this Licence and Schedule 1, item 1; and
  - iii. Results shall be reported in the Annual Water Licence Report as per Part B, item 10 of this Licence and Schedule 1, item 1.

8. The **Dyke A Construction and Management Plan** and **Dyke Construction and Management Plan**, referred to in Part G, items 15 and 16 of this Licence shall include, but not be limited to, the following information:

- a) Construction methods;
- b) Mitigation methods;
- c) Action Levels and monitoring requirements related to each dyke;
- d) Mitigation for working with heavy equipment in or near Water;
- e) Description of dyke construction materials;
- f) Actions to prevent the migration of sediment from the work area;
- g) Monitoring to assess the sediment releases and frequencies;
- h) Action Levels or cut-off limits for total suspended solids and turbidity measurements during dyke construction to ensure that EQC under Part G, item 9 of this Licence will not be exceeded; and
- i) Reporting requirements for dyke construction monitoring; and monitoring of sediment control measure integrity.

9. The **Processed Kimberlite and Waste Rock Management Plan**, referred to in Part G, item 17 of this Licence shall include, but not be limited to, the following:
- a) Information regarding operation and management:
    - i. A summary, with appropriate maps or diagrams, of the facilities used for Processed Kimberlite and Waste Rock management and all the Waste streams that report to it;
    - ii. A schedule of estimated ore to be mined, and Processed Kimberlite, Waste Rock, and Overburden to be produced, divided by rock type and geochemical type, tonnage, and destination for the duration of this Licence;
    - iii. A description of the operational procedures and geometric sequencing options for depositing Processed Kimberlite, Waste Rock, and Overburden for each year of Operation of the current licence duration;
    - iv. A description, including site maps to scale, of the Proposed Kimberlite ore stockpile area;
    - v. A description, including site maps to scale, of the Overburden stockpile area;
    - vi. A description of the geochemical criteria for management and placement of PAG Waste Rock and Processed Kimberlite including linkages to the Geochemical Characterization and Management Plan;
    - vii. A summary of Water management procedures including:
      - a. An identification of all potential sources of drainage from each storage site and the distance to the downstream Receiving Environment;
      - b. A detailed description, including a map or diagram, of the structures intended to contain, withhold, divert, or retain Water or Wastes related to the facilities for Processed Kimberlite and Waste Rock management and their predicted performance in terms of flow, capacity, and Water quality parameters;
      - c. A summary of proposed contingency measures for controlling runoff and Seepage Water volume, routing, and quality; and
      - d. A summary of any linkages to activities described in the Water Management Plan; and
    - viii. Any other information required to describe how the facilities for Processed Kimberlite and Waste Rock will be managed and operated such that the objectives listed in Part E, item 6 and Part G, item 1 of this Licence are achieved.
  - b) Information regarding monitoring activities includes:
    - i. Details and rationale for monitoring and inspection, including geotechnical stability, thermal characterization, Seepage quality and quantity, and run-off for all components:
      - a. Monitoring locations, types of instrumentation used, and frequency of monitoring, including a site map to scale; and
      - b. Predicted performance values based on expected facility design;
    - ii. Linkages to other monitoring programs and the SOP required in this Licence; and
    - iii. Any other information about the monitoring that will be performed to meet the objectives in Part G, item 1 of this Licence.

- c) Information about 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 objectives listed in Part G, item 1 of this Licence are met. This description shall include:
    - a. Definitions, with rationale, of Action Levels applicable to the performance of the Waste Rock piles and processed kimberlite containment areas with respect to monitored parameters; 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 if the Action Levels is exceeded.
  - ii. Results shall be reported in the Annual Water Licence Report as per Part B, item 10 of this Licence and Schedule 1, item 1.

## Schedule 6

### Part I: Aquatic Effects Monitoring

1. The **AEMP Design Plan** referred to in Part I, 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, to be completed with the communities, due to changes in Water quality in the Kennady Lake watershed and downstream watersheds;
      - i. Any other Receiving Environment components necessary to fulfill the objectives of Part I, item 1 of this Licence; and
      - j. Monitoring to verify or assess the Report of Environmental Impact Review 0607-001 predictions relating to the trophic and dissolved oxygen status of surface Waters in the Kennady Lake watershed and downstream watersheds.
    - ii. Monitoring for the purpose of assessing the mixing and dilution of effluent in Lake N11 and Area 8 during Operations.
  - c) A description of the AEMP sampling and analysis plan required to satisfy the objectives of Part I, 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, mineral exploration, 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 SNP monitoring will be incorporated into 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:
    - iii. Definitions, with rationale, for Significance Thresholds and tiered Action Levels applicable to the aquatic Receiving Environment of the Project; and
    - iv. For each Action Level:
      - a. A description of the rationale including, but not limited to, a consideration of the predictions and conclusion of the Report of Environmental Impact Review 0607-001;
      - 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 I, 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 made during the Report of Environmental Impact Review 0607-001 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 I, item 1 of this Licence or as requested by the Board.
  
3. The **AEMP Annual Report** referred to in Part I, 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) A comparison of predicted mixing and dilution of effluent in Lake N11 and Area 8 in comparison to monitoring data;
  - g) 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 I, 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 on behalf of the Mackenzie Valley Land and Water Board**



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**A/Chair**  
**Floyd Adlem**



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**Witness**  
**Amanda Gauthier**

**Annex A: Surveillance Network Program**  
**Annexed to Water Licence MV2005L2-0015 Part B, item 6**  
**De Beers Canada Inc. – Gahcho Kué Project**

**Table of Contents:**

Annex A: Surveillance Network Program (SNP)

- Part A: Reporting Requirements
- Part B: Site Descriptions and Monitoring Requirements
- Part C: Meteorological Monitoring Requirements

**Part A: Reporting Requirements:**

1. The effective date of this Surveillance Network Program is September 24, 2014.
2. Beginning September 24, 2014, and for every month thereafter, the Licensee shall submit a **Surveillance Network Program Report** to the Board and an Inspector, which shall include, but not be limited to the following:
  - a) Electronic and tabular summaries of all data and information generated under the SNP 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 02 and 04) compared to the Effluent Quality Criteria under Part G 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 8 of this Licence;
  - e) The coordinates of all SNP stations which were established within the month being reported, including an updated map identifying the locations of all the SNP stations;
  - 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. The Licensee shall not commence Drawdown of Kennady Lake until the Analyst has approved the Plan.
7. The Licensee shall adhere to 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 Analyst, the Licensee shall revise the Plan according to the Analyst's direction and re-submit it to the Analyst for a decision.
9. Prior to commencing Drawdown of Kennady Lake and in accordance with Schedule 5, item 1(c)(iii) of this Licence, the Licensee shall conduct a correlation survey to verify the relationship between turbidity and total suspended solids in natural and disturbed waters at the Project. The results of the correlation survey shall be submitted to the Board within 60 days of completion of the survey.

## Part B: Site Descriptions and Monitoring Requirements

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

### SNP Station Quick Reference Table

SNP Station #	Description
01	Edge of mixing zone in Lake N11
02	In-line monitoring for end-of-pipe Discharge from Kennady Lake to Lake N11
03	Edge of mixing zone in Area 8
04	In-line monitoring for end-of-pipe Discharge from Kennady Lake to Area 8
05	Water Management Pond – North of West Mine Rock Pile
06	Water Management Pond – Southwest of Dyke L
07	Effluent from Sewage Treatment Plant
08	Wastewater collection sump – In-line from 5034 Open Pit
09	Wastewater collection sump – In-line from Hearne Open Pit
10	Wastewater collection sump – In-line from Tuzo Open Pit
11	Seepage survey – West Mine Rock Pile
12	Seepage survey – South Mine Rock Pile
13	Seepage survey – Fine PKC Facility
14	Seepage survey – Coarse PKC Facility
15	Dyke seepage – North of Dyke E
16	Dyke seepage – North of Dyke D
17	Dyke seepage – East of Dyke A1
18	Outlet of Lake N11
19	Outlet of Area 8
20	Intake point in Water Management Pond for Discharge to Lake N11 and Area 8

**SNP 01 (Construction and Operations)**

<b>Description</b>	Edge of mixing zone in Lake N11: three sites at the edge of the mixing zone created by the submerged diffuser at the end of the Discharge pipe.		
<b>Location</b>			
<b>Sampling Frequency</b>	Weekly (during Discharge)	Twice (at the beginning of Discharge period and on final day of Discharge)	Sediment (once a year, in the fall)
<b>Sampling Parameters During Drawdown of Kennady Lake</b>	Water elevation (in Lake N11), pH, TSS, turbidity	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup> , total metals <sup>(d)</sup>	Total phosphorus, total/inorganic/organic carbon, total metals <sup>(f)</sup> , extractable petroleum hydrocarbons, %sand, %silt, %clay
<b>Sampling Parameters During Discharge from Water Management Pond</b>	Water elevation (in Lake N11) Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup> , total metals <sup>(d)</sup> , extractable petroleum hydrocarbons	-	Total phosphorus, total/inorganic/organic carbon, total metals <sup>(f)</sup> , extractable petroleum hydrocarbons, %sand, %silt, %clay
<b>Rationale</b>	To verify that water quality objectives are achieved at the edge of mixing zone.		
<b>Status</b>	Active during any Discharge of Water or Wastewater from Kennady Lake or the Water Management Pond to Lake N11.		

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

**SNP 02 (Construction and Operations)**

<b>Description</b>	In-line monitoring for end-of-pipe Discharge from Kennady Lake to Lake N11			
<b>Location</b>				
<b>Sampling Frequency</b>	Continuously (during Discharge, by in-line monitoring)	Daily (during Discharge)	Weekly (during Discharge)	Twice (at the beginning of Discharge period and on final day of Discharge period)
<b>Sampling Parameters During Drawdown of Kennady Lake</b>	Flow <sup>(*)</sup> , volume <sup>(*)</sup>	Physical parameters <sup>(a)</sup>	Water elevation (in Lake N11)	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup> , total metals <sup>(d)</sup> , extractable petroleum hydrocarbons, BTEX <sup>(h)</sup> , total and faecal coliforms, <i>Escherichia coli</i>
<b>Sampling Parameters During Discharge from Water Management Pond</b>	Flow <sup>(*)</sup> , volume <sup>(*)</sup>	-	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup> , total metals <sup>(d)</sup> , extractable petroleum hydrocarbons, BTEX <sup>(h)</sup> , Water elevation (in Lake N11)	Total and faecal coliforms, <i>Escherichia coli</i>
<b>Rationale</b>	Compliance monitoring site, in accordance with Effluent Quality Criteria in Part G, item 9 and 30 of this Licence.			
<b>Status</b>	Active during any Discharge of Water or Wastewater from Kennady Lake or the Water Management Pond to Lake N11.			

**SNP 03 (Construction and Operations)**

<b>Description</b>	Edge of mixing zone in Area 8: three sites at the edge of the mixing zone created by the submerged diffuser at the end of the discharge pipe.		
<b>Location</b>			
<b>Sampling Frequency</b>	Weekly (during Discharge)	Twice (at the beginning of Discharge, and on final day of Discharge)	Sediment (once a year, in the fall)
<b>Sampling Parameters During Drawdown of Kennady Lake</b>	Water elevation (in Area 8), pH, TSS, turbidity	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup> , total metals <sup>(d)</sup>	Total phosphorus, total/inorganic/organic carbon, total metals <sup>(f)</sup> , extractable petroleum hydrocarbons, %sand, %silt, %clay
<b>Sampling Parameters During Discharge from Water Management Pond</b>	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup> , total metals <sup>(d)</sup> , extractable petroleum hydrocarbons, Water elevation (in Area 8)	-	Total phosphorus, total/inorganic/organic carbon, total metals <sup>(f)</sup> , extractable petroleum hydrocarbons, %sand, %silt, %clay
<b>Rationale</b>	To verify that water quality objectives are being met at the edge of the mixing zone.		
<b>Status</b>	Active during any Discharge of Water or Wastewater from Kennady Lake or the Water Management Pond to Area 8.		



**SNP 04 (Construction and Operations)**

<b>Description</b>	In-line monitoring for end-of-pipe Discharge from Kennady Lake to Area 8.			
<b>Location</b>				
<b>Sampling Frequency</b>	Continuously (during Discharge, by in-line monitoring)	Daily (during Discharge)	Weekly (during Discharge)	Twice (at the beginning of Discharge period and on final day of Discharge period)
<b>Sampling Parameters During Drawdown of Kennady Lake</b>	Flow <sup>(*)</sup> , volume <sup>(*)</sup>	Physical parameters <sup>(a)</sup>	Water elevation (in Area 8)	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup> , total metals <sup>(d)</sup> , extractable petroleum hydrocarbons, BTEX <sup>(h)</sup> , total and faecal coliforms, <i>Escherichia coli</i>
<b>Sampling Parameters During Discharge from Water Management Pond</b>	Flow <sup>(*)</sup> , volume <sup>(*)</sup>	-	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup> , total metals <sup>(d)</sup> , extractable petroleum hydrocarbons, BTEX <sup>(h)</sup> , Water elevation (in Area 8)	Total and faecal coliforms, <i>Escherichia coli</i>
<b>Rationale</b>	Compliance monitoring site, in accordance with Effluent Quality Criteria in Part G, item 9 and 31 of this Licence.			
<b>Status</b>	Active during any Discharge of Water or Wastewater from Kennady Lake or the Water Management Pond to Area 8.			

**SNP 05 (Construction and Operations)**

<b>Description</b>	Water Management Pond - North of West Mine Rock Pile	
<b>Location</b>		
<b>Sampling Frequency</b>	Monthly (physicochemical profile measurements at 1 m depth intervals; number of water samples to be determined by presence/absence of stratification)	Sediment (once a year, in the fall)
<b>Construction and Operational Sampling Parameters</b>	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup> , total metals <sup>(d)</sup> , Water elevation.	Total phosphorus, total/inorganic/organic carbon, total metals <sup>(f)</sup> , extractable petroleum hydrocarbons, %sand, %silt, %clay
<b>Rationale</b>	To monitor the influence of the West Mine Rock Pile on Water quality in the Water Management Pond.	
<b>Status</b>	Active upon establishment of the Water Management Pond.	

**SNP 06 (Construction and Operations)**

<b>Description</b>	Water Management Pond - Southwest of Dyke L	
<b>Location</b>		
<b>Sampling Frequency</b>	Monthly (physicochemical profile measurements at 1 m depth intervals; number of water samples to be determined by presence/absence of stratification)	Sediment (once a year, in the fall)
<b>Construction and Operational Sampling Parameters</b>	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup> , total metals <sup>(d)</sup> , extractable petroleum hydrocarbons, BTEX <sup>(h)</sup> , Water elevation	Total phosphorus, total/inorganic/organic carbon, total metals <sup>(f)</sup> , extractable petroleum hydrocarbons, %sand, %silt, %clay
<b>Rationale</b>	To monitor the influence of the Fine PKC Facility on Water quality in the Water Management Pond.	
<b>Status</b>	Active upon establishment of the Water Management Pond.	

### SNP 07 (Construction and Operations)

<b>Description</b>	Effluent from the Sewage Treatment Plant		
<b>Location</b>			
<b>Sampling Frequency</b>	Continuously (by in-line monitoring)	Monthly	
<b>Construction and Operational Sampling Parameters</b>	Flow <sup>(*)</sup> , volume <sup>(*)</sup> , physical parameters <sup>(a)</sup>	Physical parameters <sup>(a)</sup> , nutrients <sup>(c)</sup> , BOD, total and faecal coliforms, <i>E. coli</i> , extractable petroleum hydrocarbons, BTEX <sup>(h)</sup> , oil and grease	
<b>Rationale</b>	To monitor Sewage effluent quality prior to mixing with other Waste streams. Compliance monitoring site, in accordance with Effluent Quality Criteria in Part G, item 27 of this Licence.		
<b>Status</b>	Active when the Sewage Treatment Plant is operating.		

### SNP 08 (Operations)

<b>Description</b>	Wastewater collection sump - In-line from 5034 Open Pit			
<b>Location</b>				
<b>Sampling Frequency</b>	Continuously (when sump is active)	Daily (when sump is active)	Weekly (when sump is active)	Monthly (when sump is active)
<b>Operational Sampling Parameters</b>	Flow <sup>(*)</sup> , volume <sup>(*)</sup>	Physical parameters <sup>(a)</sup>	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup>	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup> , total and dissolved metals <sup>(d,e)</sup> , extractable petroleum hydrocarbons, BTEX <sup>(h)</sup> , radionuclides <sup>(i)</sup>
<b>Rationale</b>	To monitor the quantity and quality of groundwater and runoff collected in mined open pits prior to discharge to Water Management Pond, Collection Ponds or process plant.			
<b>Status</b>	Active when Water or Waste is pumped from the sump to the surface.			

### SNP 09 (Operations)

<b>Description</b>	Wastewater collection sump - In-line from Hearne Open Pit			
<b>Location</b>				
<b>Sampling Frequency</b>	Continuously (when sump is active)	Daily (when sump is active)	Weekly (when sump is active)	Monthly (when sump is active)
<b>Operational Sampling Parameters</b>	Flow <sup>(*)</sup> , volume <sup>(*)</sup>	Physical parameters <sup>(a)</sup>	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup>	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup> , total and dissolved metals <sup>(d,e)</sup> , extractable petroleum hydrocarbons, BTEX <sup>(h)</sup> , radionuclides <sup>(i)</sup>
<b>Rationale</b>	To monitor the quantity and quality of groundwater and runoff collected in mined open pits prior to discharge to Water Management Pond, Collection Ponds or process plant.			
<b>Status</b>	Active when Water or Waste is pumped from the sump to the surface.			

### SNP 10 (Operations)

<b>Description</b>	Wastewater collection sump - In-line from Tuzo Open Pit			
<b>Location</b>				
<b>Sampling Frequency</b>	Continuously (when sump is active)	Daily (when sump is active)	Weekly (when sump is active)	Monthly (when sump is active)
<b>Operational Sampling Parameters</b>	Flow <sup>(*)</sup> , volume <sup>(*)</sup>	Physical parameters <sup>(a)</sup>	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup>	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup> , total and dissolved metals <sup>(d,e)</sup> , extractable petroleum hydrocarbons, BTEX <sup>(h)</sup> , radionuclides <sup>(i)</sup>
<b>Rationale</b>	To monitor the quantity and quality of groundwater and runoff collected in mined open pits prior to discharge to Water Management Pond, Collection Ponds or process plant.			
<b>Status</b>	Active when Water or Waste is pumped from the sump to the surface.			

### SNP 11 (Construction and Operations)

<b>Description</b>	Seepage survey - West Mine Rock Pile	
<b>Location</b>	Any areas where seepage is encountered.	
<b>Sampling Frequency</b>	Twice a year (during freshet, and in late summer or fall)	Following major storm events
<b>Construction and Operational Sampling Parameters</b>	Flow <sup>(*)</sup> , volume <sup>(*)</sup> , physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup> , total and dissolved metals <sup>(d,e)</sup>	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup> , total and dissolved metals <sup>(d,e)</sup>
<b>Rationale</b>	To monitor the quality and quantity of Seepage from Waste Rock storage area.	
<b>Status</b>	Active when Seepage is encountered.	

### SNP 12 (Construction and Operations)

<b>Description</b>	Seepage survey - South Mine Rock Pile	
<b>Location</b>	Any areas where seepage is encountered.	
<b>Sampling Frequency</b>	Twice a year (during freshet, and in late summer or fall)	Following major storm events
<b>Construction and Operational Sampling Parameters</b>	Flow <sup>(*)</sup> , volume <sup>(*)</sup> , physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup> , total and dissolved metals <sup>(d,e)</sup>	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup> , total and dissolved metals <sup>(d,e)</sup>
<b>Rationale</b>	To monitor the quality and quantity of Seepage from Waste Rock storage areas.	
<b>Status</b>	Active when Seepage is encountered.	

### SNP 13 (Construction and Operations)

<b>Description</b>	Seepage survey – Fine PKC Facility	
<b>Location</b>	Any areas where seepage is encountered.	
<b>Sampling Frequency</b>	Twice a year (during freshet, and in late summer or fall)	Following major storm events
<b>Construction and Operational Sampling Parameters</b>	Flow <sup>(*)</sup> , volume <sup>(*)</sup> , physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup> , total and dissolved metals <sup>(d,e)</sup> , extractable petroleum hydrocarbons, BTEX <sup>(h)</sup>	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup> , total and dissolved metals <sup>(d,e)</sup> , extractable petroleum hydrocarbons, BTEX <sup>(h)</sup>
<b>Rationale</b>	To monitor the quality and quantity of Seepage from Waste storage areas.	
<b>Status</b>	Active when Seepage is encountered.	

### SNP 14 (Construction and Operations)

<b>Description</b>	Seepage survey – Coarse PKC Facility	
<b>Location</b>	Any areas where seepage is encountered.	
<b>Sampling Frequency</b>	Twice a year (during freshet, and in late summer or fall)	Following major storm events
<b>Construction and Operational Sampling Parameters</b>	Flow <sup>(*)</sup> , volume <sup>(*)</sup> , physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup> , total and dissolved metals <sup>(d,e)</sup>	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , nutrients <sup>(c)</sup> , total and dissolved metals <sup>(d,e)</sup>
<b>Rationale</b>	To monitor the quality and quantity of Seepage from Waste storage areas.	
<b>Status</b>	Active when Seepage is encountered.	

### SNP 15 (Construction and Operations)

<b>Description</b>	Dyke seepage - North of Dyke E	
<b>Location</b>	Any areas where seepage is encountered.	
<b>Sampling Frequency</b>	Once a year (late in summer)	
<b>Construction and Operational Sampling Parameters</b>	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , total and dissolved metals <sup>(d,e)</sup> , nutrients <sup>(c)</sup> , extractable petroleum hydrocarbons, BTEX <sup>(h)</sup>	
<b>Rationale</b>	To monitor the quality and quantity of seepage from the Controlled Area.	
<b>Status</b>	Active when Seepage is encountered.	

**SNP 16 (Construction and Operations)**

<b>Description</b>	Dyke seepage - North of Dyke D
<b>Location</b>	Any areas where seepage is encountered.
<b>Sampling Frequency</b>	Once a year (late in summer)
<b>Construction and Operational Sampling Parameters</b>	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , total and dissolved metals <sup>(d,e)</sup> , nutrients <sup>(c)</sup> , extractable petroleum hydrocarbons, BTEX <sup>(h)</sup>
<b>Rationale</b>	To monitor the quality and quantity of seepage from the Controlled Area.
<b>Status</b>	Active when Seepage is encountered.

**SNP 17 (Construction and Operations)**

<b>Description</b>	Dyke seepage - East of Dyke A1
<b>Location</b>	Any areas where seepage is encountered.
<b>Sampling Frequency</b>	Once a year (late in summer)
<b>Construction and Operational Sampling Parameters</b>	Physical parameters <sup>(a)</sup> , major ions <sup>(b)</sup> , total and dissolved metals <sup>(d,e)</sup> , nutrients <sup>(c)</sup> , extractable petroleum hydrocarbons, BTEX <sup>(h)</sup>
<b>Rationale</b>	To monitor the quality and quantity of seepage from the Controlled Area.
<b>Status</b>	Active when Seepage is encountered.

**SNP 18 (Construction and Operations)**

<b>Description</b>	Outlet of Lake N11
<b>Location</b>	
<b>Sampling Frequency</b>	Daily (during Discharge)
<b>Construction and Operational Phase Sampling Parameters</b>	Flow <sup>(*)</sup>
<b>Rationale</b>	Compliance monitoring point for flow at the outlet of Lake N11 in accordance with Part G, item 7 of this Licence.
<b>Status</b>	Active one week prior to and during Discharge to Lake N11.

### SNP 19 (Construction and Operations)

<b>Description</b>	Outlet of Area 8
<b>Location</b>	
<b>Sampling Frequency</b>	Daily (during Discharge)
<b>Construction and Operational Phase Sampling Parameters</b>	Flow <sup>(*)</sup>
<b>Rationale</b>	Compliance monitoring point for flow at the outlet of Area 8 in accordance with Part G, item 7 of this Licence.
<b>Status</b>	Active one week prior to and during Discharge to Lake N11.

### SNP 20 (Operations)

<b>Description</b>	Intake point in Water Management Pond for Discharge to Lake N11 and Area 8
<b>Location</b>	
<b>Sampling Frequency</b>	Twice (at the beginning of Discharge period and on final day of Discharge period)
<b>Sampling Parameters During Discharge from Water Management Pond</b>	Toxicity <sup>(g)</sup>
<b>Rationale</b>	Compliance monitoring site, in accordance with Part G, item 33 of this Licence.
<b>Status</b>	Active during any Discharge from the Water Management Pond to Lake N11 or Area 8.

#### Footnotes:

- (\*) Flow and volume measurements shall be measured and recorded continuously (i.e. using electronic data storage chips or equivalent) during periods of flow or pumping, and reported in cubic metres. Note: where seepage is discontinuous at SNP 11-14, flow measurements shall be made when water samples are collected. The method used to obtain the flow measurement shall be recorded, and flow measurements shall be used to estimate flow and volume at these Stations.
- (a) Physical Parameters shall include the following measurements: Dissolved Oxygen, pH, Specific Conductivity, Temperature, Total Suspended Solids (TSS), and Turbidity. Note: during Drawdown, TSS at SNP 02 and 04 may be estimated using the site-specific TSS-turbidity relationship as determined by the correlation survey conducted in accordance with Part A, item 9 of this Annex, and as verified in accordance with Schedule 5, item 1(c)(iii).
- (b) Major Ions shall include the following parameters: Bicarbonate, Calcium, Carbonate, Chloride, Fluoride, Hardness, Hydroxide, Magnesium, Potassium, Reactive Silica (as SiO<sub>2</sub>), Sodium, Sulphate, Total Alkalinity, Total Dissolved Solids.
- (c) Nutrients shall include the following measurements/parameters: Biological Oxygen Demand (BOD –



- 5 day; where indicated), Dissolved Inorganic Phosphorus, Dissolved Organic Phosphorus, Nitrate (as N) calculated, Nitrate/Nitrite (as N), Nitrite (as N), Orthophosphate (as P), Total Ammonia (as N), Total Dissolved Phosphorus, Total Inorganic Phosphorus, Total Kjeldahl Nitrogen, Total Organic Carbon, Total Phosphorus.
- (d) Total Metals from water samples shall include the following parameters, at a minimum: Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Cesium, Cobalt, Copper, Chromium, Hexavalent Chromium, Iron, Lead, Lithium, Manganese, Mercury, Molybdenum, Nickel, Rubidium, Selenium, Silver, Strontium, Thallium, Titanium, Uranium, Vanadium, Zinc. Note: if only total metals are listed as sampling parameters at a given location for a specific phase, samples for dissolved metals shall also be collected. The samples for dissolved metals shall, be analyzed if total metals concentrations exceed established thresholds. If both total and dissolved metals are listed as sampling parameters at a given location for a specific phase, samples shall be analyzed for both total and dissolved metals.
  - (e) Dissolved Metals from water samples shall include the following parameters, at a minimum: Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Cesium, Cobalt, Copper, Chromium, Hexavalent Chromium, Iron, Lead, Lithium, Manganese, Mercury, Molybdenum, Nickel, Rubidium, Selenium, Silver, Strontium, Thallium, Titanium, Uranium, Vanadium, Zinc.
  - (f) Sediment samples shall be analyzed for the following parameters, at a minimum: Total Metals: Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Cesium, Cobalt, Copper, Chromium, Hexavalent Chromium, Iron, Lead, Lithium, Manganese, Mercury, Molybdenum, Nickel, Rubidium, Selenium, Silver, Strontium, Thallium, Titanium, Uranium, Vanadium, Zinc.
  - (g) 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. 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.
    - d. Acute toxicity – fish using Environment Canada. 2007. Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout. Environmental Protection Series, Report EPS 1/RM/13. Method Development and Application Section, Environmental Technology Centre, Ottawa, ON, Canada.
    - e. Acute toxicity – invertebrates using Environment Canada. 2000. Biological Test Method for Determining Acute Lethality of Effluents to *Daphnia magna*. Environmental Protection Series, Report EPS 1/RM/14. Method Development and Application Section, Environmental Technology Centre, Ottawa, ON, Canada.
  - (h) BTEX shall include: Benzene, Toluene, Ethyl benzene, and Xylene.
  - (i) Radionuclides shall include: Uranium; Thorium. If uranium and thorium in samples from the SNP 08, 09, or 10 (pit sumps) are determined to be leachable in groundwater, Radium-226 may also be monitored.

### Part C: 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) Wind speed, in kilometers per hour (km/h);
  - d) Hourly wind direction; and
  - e) 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.
2. A minimum of sixty (60) days prior to commencement of Drawdown the Licensee shall submit to the Board, the location, methods and frequency for measuring and recording the meteorological data identified in Part C, item 1 of this Annex.
3. The location, methods and frequency referred to in Part C, item 2 of this Annex shall be implemented as and when approved by the Board.

### Signed on behalf of the Mackenzie Valley Land and Water Board



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**A/Chair**  
**Floyd Adlem**

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**Witness**  
**Amanda Gauthier**

## Annex B: Concordance Table of Items Requiring Submission

Supplemental information to be submitted by Licensee as required through Water Licence Conditions.

Disclaimer: If there are any discrepancies between this table and the body of the Water Licence, the Water Licence conditions prevail.

Part of WL	Item	Date
B	Water Use Fee	- Upon issuance - Annually thereafter prior to the anniversary date
B	Annual Water Licence Report	- March 31, 2015 - Annually on each March 31
B	Engagement Plan	- Within 90 days of issuance - Annual review
C	Security Deposit	- Prior to commencement of activities under the WL
E	Standard Operating Procedure	- Within 60 days of issuance - Annual review
E	Rock Placement Verification Program	- Upon commencement of Construction
E	Rock Placement Verification Program Report	- Within 18 months of issuance
E	Final Detailed Construction Plan	- 60 days prior to commencement of Construction of any Engineered Structures
E	Written notifications to Board and an Inspector prior to commencement of Construction of Engineered Structures	- 10 days prior to commencement of Construction of any Engineered Structures
E	As-built Reports	- 90 days following completion of Construction of any Engineered Structures
F	Modifications to structures/facilities that don't require Designs	- 60 days prior to carrying out modification
F	Modifications to Engineered Structures: submission of updated Detailed Construction Plan	- 90 days prior to carrying out modification
G	Waste Management Plan	- Within 60 days of issuance - Annual review
G	Construction Water Management Plan	- Within 60 days of issuance - Annual review
G	Operational Water Management Plan	- 60 days prior to commencement of milling - Annual review
G	Closure Water Management Plan	- 60 days prior to commencement of refilling of Kennady Lake - Annual review
G	Groundwater Monitoring Program	- Within 6 months of issuance - Annual review
G	Drawdown Summary Report	- 4 months following completion of Drawdown of Kennady Lake
G	Erosion and Sediment Management Plan	- Within 60 days of issuance - Annual review
G	Explosives Management Plan	- Within 60 days of issuance - Annual review -
G	Geochemical Characterization and Management Plan	- Within 60 days of issuance - Annual review

G	Dyke A Construction and Management Plan	- Within 60 days of issuance - Annual review
G	Dyke Construction and Management Plan	- 60 days prior to commencement of Construction of any dykes other than Dyke A - Annual review
G	Processed Kimberlite and Waste Rock Management Plan	- 90 days prior to commencement of Construction of the South Mine Rock Pile, West Mine Rock Pile, the Fine Kimberlite Containment Facility and the Coarse Kimberlite Containment Facility - Annual review
G	Notification to an Inspector of Annual Geotechnical Inspection	- Two weeks prior to annual inspection
G	Geotechnical Inspection Report	- Report and implementation plan to be submitted 90 days from date of each inspection
G	Dam Safety Review	- Within the first 3 years following the commencement of Construction - 7 years following the first review
G	Dam Safety Review Report	- Report and implementation plan to be submitted 90 days from date of each inspection
G	EQC Evaluation Report	- 6 months prior to the proposed continuation of Discharge
H	Spill Contingency Plan	- Within 60 days of issuance - Annual Review
H	Detailed Spill and Unauthorized Discharge Report	- Within 30 days of each spill and Unauthorized Discharge
I	AEMP Design Plan	- Adhere to June 26, 2014 Plan - Revision on September 30, 2019 and every 3 years thereafter
I	Aquatic Effects Re-evaluation Report	- July 31, 2019 - Every 3 years thereafter
I	AEMP Annual Report	- May 1 each year
I	AEMP Response Plan	- Notification within 30 days from the time the Action Level exceedance is detected - Within 90 days of when the exceedance is detected for approval
J	Interim Closure and Reclamation Plan	- Within 24 months of issuance - Upon request of the Board
J	Annual Closure and Reclamation Plan Progress Report	- March 31, 2016 - Annually on each March 31
J	Final Closure and Reclamation Plan	- 24 months prior to the end of commercial Operations - Upon request of the Board
SNP	Surveillance Network Program Report	- Monthly
SNP	Quality Assurance and Quality Control Plan	- Prior to the collection of SNP samples - Annual Review
SNP	Turbidity and Total Suspended Solids Correlation Results	- 60 days upon completion of the survey
SNP	Meteorological Monitoring Plan	- 60 days prior to commencement of Drawdown

## Annex C: Revisions to Water Licence MV2005L2-0015

*List of changes that have been made to the Water Licence since issuance*

Date	Location of change	What has changed
July 23, 2015	Surveillance Network Program, Part B	Sampling parameters at SNP stations 02 and 04 revised to reference water sampling parameters for Total Metals (footnote (d)).
	Surveillance Network Program, Part B	Added Cesium to total and dissolved water analysis of water (footnote (d) and (e)).
April 18, 2016	Surveillance Network Program, Part B	SNP stations 08, 09, and 10 sampling frequency revised to include replace continuous monitoring of physical parameters with daily sampling.
	Surveillance Network Program, Part B	Footnote * revised to specify that flow and volume at SNP stations 11, 12, 13 and 14 will be measured when water samples are collected, rather than continuously.



Mackenzie Valley Land and Water Board  
7th Floor - 4922 48th Street  
P.O. Box 2130  
YELLOWKNIFE NT X1A 2P6  
Phone (867) 669-0506  
FAX (867) 873-6610

## Reasons for Decision

Issued pursuant to section 72.25 of the *Mackenzie Valley Resource Management Act*

Type A Water Licence Application	
Preliminary Screener	MVLWB
Reference/File Number	MV2005L2-0015
Applicant	De Beers Canada Inc.
Project	Gahcho Kué – Revision to Surveillance Network Program

### Decision from Mackenzie Valley Land and Water Board Meeting of

April 18, 2016

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#### Background

- September 24, 2014 – Water Licence MV2005L2-0015 (the Licence) issued to De Beers Canada Inc. (De Beers);
- March 9, 2016 – Request to revise Surveillance Network Program (SNP) received;
- April 5, 2016 – Reviewer comments due and received;
- April 12, 2016 – De Beers' responses to reviewer comments due and received; and
- April 18, 2016 – Revision request presented to Board for Decision.

On March 9, 2016, De Beers submitted a request to the Board to revise the SNP annexed to the Licence. The Board's decisions on each component of the revision request, and the reasons for each decision are discussed in detail below.

#### Decision

After reviewing De Beers' submission, the written comments received by the Board, and the staff report prepared for the Board, the Board, having due regard to the facts and circumstances, the merits of the submissions made to it, and to the purpose, scope, and intent of the MVRMA and the *Waters Act* and Regulations made thereunder, has determined that the requested changes to the SNP are approved, with noted exceptions. Specifically, the Board has made the following determinations:

**SNP Stations 08, 09 and 10:**

The SNP includes monitoring stations in the sump of each of the three planned open pits. Based on recommendations made by De Beers during the licencing phase, continuous monitoring of flow, volume, and various physical parameters is required when the sumps are active.<sup>1</sup> In its revision request, De Beers requested that continuous monitoring for physical parameters be removed at these stations, since pumping will be intermittent at this site, and inconsistent flow from the sumps can cause the sensors to dry out and/or freeze, which damages the sensors. De Beers proposed to continue weekly and monthly sampling of physical parameters as required by the Licence.<sup>2</sup> In response to review comments, De Beers modified the proposed revision to include daily sampling of these parameters during pumping.<sup>3</sup> The Board finds this approach reasonable, since continuous pumping from these sumps is not expected to be necessary at this site.

De Beers also requested that the Board revise the sampling frequency at these stations to indicate that sampling is only required when pumping is active.<sup>4</sup> The Board has not accepted this recommendation, since this is already clear in the status descriptions for these stations, which states that they are only active when pumping from the sumps is occurring.

**SNP Stations 11, 12, 13 and 14:**

The SNP also includes seepage monitoring stations for each of the two waste rock piles, and the two processed kimberlite storage facilities. Continuous monitoring of flow and volume is required at these stations even though water quality sampling is required only twice per year. De Beers requested that the requirement for continuous flow and volume monitoring be removed, since seepage is not expected to be continuous at these stations. De Beers proposed to note presence or absence of flow during the water quality sampling events.<sup>5</sup> In response to review comments that highlighted the need for quantifying the amount of seepage from each of these facilities, De Beers proposed to take discrete flow measurements at these stations when collecting water samples, and to use these measurements to estimate flow and volume of seepage from these facilities. De Beers outlined the various flow measurements that would be used in the potential scenarios that could be encountered at these seeps.<sup>6</sup>

The Board has accepted this approach and has revised the applicable footnote to account for different flow and volume monitoring requirements at these stations. When flow is measured, the methods must be recorded.<sup>7</sup> As noted in De Beers' response to review comments, the Board agrees that these alternate flow monitoring methods must be reviewed, and potentially revised, in the event that continuous seepage is observed at any of these stations.<sup>8</sup>

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<sup>1</sup> See page A-8, Updated Project Description – Attachment 8, De Beers Canada Inc, submitted to the MVLWB on

<sup>2</sup> See pages 1-2, Request to Revise SNP, De Beers Canada Inc, submitted to the MVLWB on March 9, 2016; and GNWT-ENR 3, Review Comment Summary Table, April 18, 2016.

<sup>3</sup> See GNWT-ENR 3, Review Comment Summary Table, April 18, 2016.

<sup>4</sup> See pages 1-2, Request to Revise SNP, De Beers Canada Inc, submitted to the MVLWB on March 9, 2016.

<sup>5</sup> See pages 2-3, Request to Revise SNP, De Beers Canada Inc, submitted to the MVLWB on March 9, 2016

<sup>6</sup> See ECCC 1, GNWT-ENR 3, and GNWT- Lands 1, Review Comment Summary Table, April 18, 2016.

<sup>7</sup> See ECCC 1, GNWT-ENR 3, Review Comment Summary Table, April 18, 2016

<sup>8</sup> See GNWT-ENR 3, Review Comment Summary Table, April 18, 2016.

Water Licence MV2005L2-0015 contains provisions that the Board feels necessary to ensure and monitor compliance with the MVRMA and the *Waters Act* and the Regulations made thereunder and to provide appropriate safeguards in respect of the Applicant's use of the waters and/or deposit of waste affected by the Licence. The Board will provide additional referenced material or documents if requested in writing to do so.

SIGNATURE

Mackenzie Valley Land and Water Board



April 18, 2016

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Floyd Adlem  
A/Chair

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Date