April 4, 2016

Mr. David Wells
Superintendent – Environment
Diavik Diamond Mines Inc.
P.O. Box 2498, 300-5201, 50 Avenue
Yellowknife, NT X1A 2P8

Dear Mr. Wells,

**DDMI’s Water Management Plan – Version 14**


The Board has not approved Version 14 of the DDMI’s WMP at this time because of concerns identified with the listing of ‘additional waters’ in Section 1.4 ‘Authorized Discharges’ in the Plan. DDMI is to submit a letter to the Board within 30 days of receipt of the Board’s decision which explains in detail what the terms “authorized discharge” or “authorized for discharge” means to DDMI when used in relation to each item listed in section 1.4 of Version 14 of the WMP. Any such explanation should include specific references to Licence provisions, the SNP, and relevant management plans. Once the Board has reviewed this information, the Board will inform DDMI when to submit Version 14.1 of its WMP and may provide additional direction in consideration of the information provided in DDMI’s letter to the Board.

In addition, DDMI is to submit details of how it manages the PKC Facility to meet the design specifications outlined in the PKC Facility Plan and to avoid water ponding against the dams. If DDMI believes this information is most relevant in the PKC Facility Plan, DDMI is to submit an updated version of this Plan. Otherwise, DDMI is to include these details in Version 14.1 of the WMP, once the Board sets the deadline for resubmission.

The Board has also provided direction to DDMI in consideration of additional issues identified in review of Version 14 of the WMP. Please read the attached Reasons for Decisions carefully. Should you have any questions, please contact Ryan Fequet at rfequet@wlwb.ca or by phone at 867-765-4589.

Sincerely,

Chair, Wek’èezhìi Land and Water Board

Copied: Diavik Distribution List
Reference/File Number: W2015L2-0001 (Type “A” Water Licence)

Licensee: Diavik Diamond Mines Inc. (DDMI)

Subject: Water Management Plan, Version 14

Decision from the Wek’èezhìi Land and Water Board
Meeting of March 23, 2016

Issued pursuant to Section 54 of the Waters Act, S.N.W.T. 2014, c.18

1.0 Decision


The Board:

1. (a) has not approved Version 14 of DDMI’s Water Management Plan; and,
   (b) requires DDMI to explain in detail what it understand the terms “authorized discharge” or “authorized for discharge” to mean when used in relation to each item currently listed in section 1.4. Any such explanation should include specific references to Licence provisions, the SNP, and relevant management plans.

2. requires DDMI to clarify the intent and usage of all collection ponds, as well as ensure consistency in supporting documentation when it submits its Surveillance Network Program (SNP) amendment;

3. requires DDMI to indicate in Version 14.1 whether the freeboard limit is included or not where capacity of a facility is noted in the Plan (e.g., such as in regards to the North Inlet);

4. requires DDMI to submit the details of how it manages the PKC Facility to meet the design specifications outlined in the PKC Facility Plan and to avoid water ponding against the dams. If DDMI believes this information is most relevant in the PKC Facility Plan, DDMI is to submit an
updated version of this Plan. Otherwise, DDMI is to include these details in Version 14.1 of the Water Management Plan, once the Board sets the deadline for resubmission;
5. directs DDMI to ensure that all notable changes in the Plan are specified in the revision; and,
6. requests that DDMI be more helpful in their responses during public reviews in an effort to make the review process more efficient and effective for all parties.

2.0 Background

The Water Management Plan (WMP or the Plan) provides details of the integrated water collection, reuse, and treatment system at the Diavik Mine Site. Water management at Diavik includes process water used in the diamond recovery plant, potable water, mine water (infiltration of lake and groundwater plus surface runoff), water seepage through the dikes, sewage, and runoff from the mine site, roads and the airstrip. Part H, Item 2 of the Water Licence requires that DDMI operates in accordance with the approved Water Management Plan (the Plan). Schedule 6, Item 1(a-d) of Water Licence W2015L2-0001 outlines the required components for the Water Management Plan. Item 1(b) requires DDMI to provide “a complete list of Waste streams that are discharged to Lac de Gras without treatment”. This was the only new requirement compared to the Schedule for the Water Management Plan in DDMI’s previous Water Licence (W2007L2-0003).

In accordance with Part H, Item 3 of Water Licence W2015L2-0001, an updated Water Management Plan (Version 14) was submitted by DDMI to the Board for approval, within 60 days of the effective date of their renewed Licence.¹ The Water Management Plan was circulated for comment to the Diavik distribution list on January 5, 2016. Reviewers were given until February 26, 2016 to submit comments. The Government of the Northwest Territories (GNWT) – Environment and Natural Resources (ENR), GNWT – Department of Lands, and Board staff submitted comments on the Plan. DDMI submitted their responses to the comments on March 2, 2016.²

3.0 Reasons for Decision

Within the Water Management Plan, DDMI has included a list of waste streams it has identified as being authorized for discharge without treatment based on the conditions regulating those wastes in the Water Licence. It has also identified “additional waters”, which DDMI indicates as having “potential to be released to the receiving environment that may ultimately drain to Lac de Gras without treatment”. The Board identified significant concern with the uncertainties surrounding the latter. These uncertainties have led to the Board’s decision not to approve the Water Management Plan at this time and provision of additional direction to DDMI with respect to DDMI’s understanding of authorized discharges. Additional discussion and direction are provided to DDMI throughout these Reasons for Decision in consideration of additional concerns identified during the review period.

¹ The effective date of W2015L2-0001 was October 19, 2015, and Version 14 of the Water Management Plan was received by the Board on December 16, 2015.
3.1 Provision of DDMI’s Understanding of “Authorized Discharges” in consideration of Section 1.4

As required by Schedule 6(1)(b), DDMI has added Section 1.4 ‘Authorized Discharges’ which lists the Waste streams that are authorized to be discharged to Lac de Gras without treatment (please see page 44 of the Water Licence Renewal Reasons for Decision\(^3\) for a detailed explanation regarding this new reporting requirement).

Section 1.4 of the Water Management Plan reads:

“The following waters may be authorized for discharge without treatment provided a) water sampling results have been provided to the Inspector demonstrating that the water quality is within the regulated effluent quality criteria (EQC) and b) the Inspector has provided written authorization (See Water License W2015L2-0001 Part H Item 33):

- A21 pool water (SNP 1645-41)
- A21, A154, A418 dike seepage water (SNP 1645-52, 53, 54)
- Collection pond water (SNP 1645-42, 44-47, 67-69, 74, 76)"

The Board reviewed these three waste streams and confirms that Part E, Item 3 and Part H, Item 20(e) of Water Licence W2015L2-0001 permits discharge of untreated water from the A21 pool water and A21, A154, and A418 dike seepage water, respectively, provided that discharged waters meet applicable Effluent Quality Criteria (EQC) specified in the Water Licence and satisfy Part H, Item 33. To satisfy Part H, Item 33, water sampling results must be provided to an Inspector prior to discharge and the discharge must be authorized in writing by the Inspector.

However, DDMI has also listed sources of ‘additional waters’ in the newly-added Section 1.4 ‘Authorized Discharges,’ which it identifies as waters that may end up entering the Lac de Gras without treatment. Section 1.4 of the Water Management Plan continues by stating:

“There are additional waters with potential to be released to the receiving environment that may ultimately drain to Lac de Gras without treatment. These waters are general outside of the water management area or water that may exist during events:

1. Surface runoff/seepage outside the Water Management System including but not limited to
   a. north side of airstrip;
   b. ammonium nitrate storage and emulsion plant;
   c. seepage bypassing collection systems;
   d. pipeline leaks;
   e. south country rock pile; and,
   f. roads, laydowns and dams.

2. Excess Dust Control Water from roads, stockpiles, airstrip.
3. Excess Fire Water applied in emergency conditions.

The management and response to runoff/seepage outside of the Water Management System covered by Section 7 of the Operational Phase Contingency Plan Version 19.” [numbering and

\(^3\) See the WLWB Online Registry for Diavik – WL Renewal – Reasons for Decision – Sept 2_15
It is unclear why these listed items would be considered “outside of DDMI’s Water Management System” and included in a section regarding Authorized Discharges. Section 11(1) of the Waters Act specifies that other than in accordance with the conditions of a Water Licence, no person shall deposit or permit the deposit of waste in waters.

Part B, Item 1 of the Water Licence reads: “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 deposits of such Waste may enter any waters.” Part B, Item 1 further indicates that, other than in the case of an accidental spill, or the authorized discharges explicitly identified by the Licence, if there are any waters which may be considered waste due to the Project or its components, it is the responsibility of DDMI to ensure that these do not enter the receiving environment. In accordance with Part I, Item 3 of the Licence, DDMI must implement its Operational Phase Contingency Plan whenever an unauthorized discharge occurs or is foreseeable.

Including a list of waters that DDMI regards as “outside of the Water Management System” in a section of the Water Management Plan titled ‘Authorized Discharges,’ might imply that these discharges are acceptable and permissible without proper acknowledgement of how this has been determined. Board approval of the Water Management Plan which includes this list could indicate to DDMI that the Board has authorized these “additional waters” to enter the receiving environment, even in instances where these discharges have not been previously authorized. Therefore, Board has determined it needs further information and clarification related to section 1.4 of the Water Management Plan.

1. (a) The Board has not approved Version 14 of the Water Management Plan, due to the inclusion of a list of “waters outside of the Water Management System” in the section of the Water Management Plan detailing Authorized Discharges.

   (b) DDMI is to explain in detail what it understands the terms “authorized discharge” or “authorized for discharge“ to mean when used in relation to each item currently listed in section 1.4. Any such explanation should include specific references to Licence provisions, the SNP and relevant management plans. Once this response is in hand, the Board may recommend further action from the Board to ensure DDMI compliance with the Licence.

The Board requires DDMI to submit this additional information in a letter to the Board, within 30 days of receipt of the Board’s decision. The Board will inform DDMI that once the Board has reviewed this information and will provide additional direction to DDMI for submission of Version 14.1 of its Water Management Plan.
3.2 Clarify Purpose of Collection Ponds

In review of the inclusion of pond water in Section 1.4 of the Water Management Plan, the Board identified contradictory information between the Licence and the Surveillance Network Program (SNP). Specifically, there is a discrepancy surrounding which facilities these collection ponds are supporting. For example, in the SNP of the Water Licence, the rationale included for SNP station (1645-44) at Pond 7 is: “collects surface runoff from a portion of the road to the ammonium nitrate storage and provides secondary containment for part of the PKC South Cell”. However, the original plan for Ponds 1-7 was for them to be “collection ponds for the country rock and till stockpiles, as well as for seepage from the PKC.”

A detailed investigation into the SNP and its conformity to the Water Licence and supporting documents may be warranted as other issues are known to exist. In the Water Licence Renewal Reasons for Decision (see page 53), it is stated that “errors in the SNP were noticed during administration of W2007L2-0003 while the renewal proceeding was ongoing” and that the “Board will consider revisions to the SNP following the Water Licence Renewal.”

2. **DDMI is to clarify the intent and usage of all collection ponds as well as ensure consistency in supporting documentation when it submits its SNP amendment.**

3.3 Indicate Freeboard Limit

In their review comments, ENR requested clarification on whether the 2.8 million m$^3$ of excess capacity in the North Inlet is inclusive of the freeboard limit. DDMI confirmed that this excess storage capacity is inclusive of the freeboard limit, and a required 1.5 m freeboard above the maximum storage is maintained at all times in the North Inlet, as per Part H, Item 23 of the Water Licence.

3. **DDMI is to indicate in Version 14.1 whether the freeboard limit is included or not where capacity of a facility is noted in the Water Management Plan.**

3.4 Provide Details Regarding Management of Waters to Prevent Ponding against PKC Dams

In review of the Water Management Plan ENR (comment #4) noted that recent annual and monthly reports suggest that there is an accumulation of water in the vicinity of the PKC dams, which DDMI is required to prevent as per Part F, Item 9 of the Water Licence. ENR recommended that “the Water Management Plan require the PKC pool be maintained in the central portion of the PKC and that the freeboard be set such that the pond is maintained at least 100 m from the dams of the PKC”. DDMI did not provide details on the distance that they maintain. DDMI simply responded that “these types of facility design operating parameters are more appropriately included in the facility design report or operating

---

4 See the WLWB Online Registry for [N7L2-1645 – Diavik – Drainage Ditches and Collection Ponds – Aug 30_99 (page 24)](page 24) and [N7L2-1645 – Diavik – Design Basis Memorandum – Drainage Ditches and Collection Ponds – Sep 18_00 (page 6)](page 6)

5 See the WLWB Online Registry for [Diavik – WL Renewal – Reasons for Decision – Sept 2_15](page 6)

6 As per Part H, Item 23 of the Water Licence, DDMI must maintain a minimum freeboard limit of 1.5 m below the engineered emergency Spillway in the North Inlet Facility at all times.

7 Part F, Item 9 of the Water Licence reads: “There shall be no accumulation of water against the containment Dam structures of the Processed Kimberlite Containment Facility, unless approved by the Board.”
and maintenance manual rather than in the Water Management Plan” and to “please also see the recent specifications regarding spillway design”. The Board confirms that the PKC Facility Phase 6 Design Report, dated March 1, 2013, includes these design parameters for the PKC Facility. The PKC Pond has a freeboard of 2.3 m, and this freeboard requirement is based on the Canadian Dam Association’s Dam Safety Guidelines (CDA, 2007). However, the Design Report does not speak to how DDMI actually manages the water.

In follow-up communication with DDMI, Board staff inquired why DDMI believed the information should be included in the PKC Facility Plan as opposed to the Water Management Plan. DDMI responded that the information is captured by the requirements of Water Licence Schedule 6, Item 2(d) because the PKC Facility Plan is “the deposition plan for the processed kimberlite that is used to manage the location of the pond”. Section 3.2 of the currently-approved PKC Facility Plan (Version 2.1), refers to the operation of the PKC pond and states that “DDMI submits a Water Management Plan to the WLWB annually that describes in detail the PKC water management and PKC water balance” and that “a summary of PKC water management is provided here [the Water Management Plan]”. The PKC Facility Plan then describes that one of the objectives is to “avoid water ponding against the dams” and notes that “any water ponding against the dams could degrade the permafrost foundation and could enhance seepage potential through the dam and the foundations”. However, it does not appear that the PKC Facility Plan contains any further details regarding how the PKC Facility is managed to avoid water ponding from occurring.

Given that it is of upmost importance that the process for avoiding water ponding in the PKC Facility is detailed to the greatest extent possible, the Board requires DDMI to submit the details of how it manages the PKC Facility to meet the design specifications outlined in the PKC Facility Plan and to avoid water ponding against the dams.

4. **DDMI is to submit the details of how it manages the PKC to meet the design specifications outlined in the PKC Facility Plan and to avoid water ponding against the dams.**

If DDMI believes this information is most relevant in the PKC Facility Plan, DDMI is to submit an updated version of the Plan. Otherwise, DDMI is to include these details in Version 14.1 of the Water Management Plan, once the Board sets the deadline for submission.

3.5 **Identify all Notable Changes in Plans and Provide Thorough Responses to Reviewer Comments**

With respect to reporting on notable changes in revised versions of its management plans, DDMI did provide an extensive summary of the changes made in Version 14 of the Plan as compared to Version 13. However, after review of Version 14 against Version 13, The Board identified that the list of revisions provided did not capture all changes made from Version 13. The following additional notable changes in were identified in review of Version 14:

---

8 See the WLWB Online Registry for [W2007L2-0003 - Diavik - Notice of Construction - PKC Dam Raise Phase VI Design Report - Mar 12_13](#).

9 See the WLWB Online Registry for [Diavik – Water Management Plan – Version 14 – Response Follow-up – Mar 8_16](#).

• Section 1.3: Departmental responsibilities are updated, however DDMI did not highlight that an entire new group with water management responsibilities has been set up; the A21 and Surface Mining Group. This group manages A21 and PKC constructions;

• Section 2.3.3: There are two pipes, one insulated, heat-traced pipe and a second insulated, non-heat traced pipe set up to pump underground waters from the main intersection to the NIWTP. In Version 13, the second pipe is called a back-up pipe;

• Section 2.3.3: The following sentence has been removed: “Additional dewatering galleries will be installed as mining advances”;

• Section 3.1.2: Version 13 listed Ponds 2 and 3 as one of the sources of water to the North Inlet. Version 14 specifies that the North Inlet receives water transfers from Ponds 1, 2, 3, 4, 5 and 13, if required; and

• Section 3.6.2: The Coarse Processed Kimberlite (CPK) versus Fine Processed Kimberlite (FPK) ratio has been updated following Process Plant modifications.

While the Board has not identified concerns with these changes, the Board is uncertain whether reviewers would have been aware of them when they reviewed the document and whether or not they would have had concerns about them.

4. **DDMI to ensure that all notable changes in the Plan are specified in the revision.**

The Board also identified concerns with responses provided by DDMI during the review period. Specifically, ENR (comment #3) requested “clarification on the relationship between dike construction activities at A21 and water reporting to the North Inlet” and noted that “the Water Management Plan should also identify the method of water reporting to the North Inlet (e.g., sediment suction / dredge pipeline, runoff from dredged solid storage area, dewatering pipeline from A21 area, etc.)”. DDMI’s full response was to “please see the A21 Construction Environmental Management Plan”. Follow-up communication by Board staff determined that DDMI was referring to Sections 8.3 and 14 of the CEMP, Version 4.2.\(^\text{11}\) That Board reviewed these sections and believe the information contained within Sections 8.3 and 14 in the CEMP likely satisfies GNWT-ENR’s recommendation. It is understood that DDMI is most familiar with their management plans, and it is expected that DDMI will provide specific references to relevant sections or pages when additional information or clarification is requested.

5. **DDMI is to be more helpful in their responses during public reviews in an effort to make the review process more efficient and effective for all parties.**

Signed the 4\(^{th}\) day of April, 2016, on behalf of the Wek’éezhii Land and Water Board

[Signature]

Witness

Violet Camsell-Blondin
Chair, Wek’éezhii Land and Water Board

\(^{11}\) See the WLWB Online Registry for [Diavik – Water Management Plan – Version 14 – Response Follow-up – Mar 8_16](#)