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June 28, 2019

File: W2018L2-0003

Mr. Michael J. Byron  
Nighthawk Gold Corporation  
141 Adelaide St. W., Suite 301  
Toronto, Ontario  
M5H 3L5

Sent by email

Dear Michael. Byron,

**Re: Interim Closure and Reclamation Plan – Version 3.2**

The Wek'èezhìi Land and Water Board (the Board) met on June 13, 2019 and considered Version 3.2 of Nighthawk Gold Corp.'s (Nighthawk) interim Closure and Reclamation Plan (CRP).<sup>1</sup>

As described in the Board's Reasons for Decision, the Board has not approved Version 3.2 of the interim CRP and has provided direction for Version 3.3. Please review the attached Reasons for Decision for further information.

Yours sincerely,

A handwritten signature in blue ink, appearing to read "Joe Mackenzie".

Joe Mackenzie  
Chair, Wek'èezhìi Land and Water Board

Attachment:

- Reasons for Decision

Copied: Wek'èezhìi East Distribution List

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<sup>1</sup> See WLWB Online Registry for [W2012L1-0002 - Nighthawk - Interim Closure and Reclamation Plan - Version 3.2 - Oct 31 18.pdf](#)



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## Reasons for Decision

<b>Reference/File Number:</b>	W2018L2-0003
<b>Licensee:</b>	Nighthawk Gold Corp.
<b>Subject:</b>	Version 3.2 of the interim Closure and Reclamation Plan

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**1.0 Decision**

On June 13, 2019, the Wek'èezhii Land and Water Board (WLWB or the Board) met and considered Version 3.2 of Nighthawk Gold Corp.'s (Nighthawk interim Closure and Reclamation Plan (CRP)). In review of this submission,<sup>2</sup> reviewer comments, and proponent responses, and previous Board direction,<sup>3</sup> the Board has decided to not approve Version 3.2 of the interim CRP. The Board requires Nighthawk to re-submit the interim CRP as Version 3.3 no later than June 29, 2020, in which Nighthawk must incorporate the following revisions and actions:

1. Regarding closure objectives and engagement:
  - a. Work towards approval of closure objectives for the site and the closure activity for the waste rock piles in Version 3.3 of the interim CRP;
  - b. Engage with all Parties on closure objectives and criteria for the site and the closure activity for waste rock piles;
  - c. Submit an engagement log as described in Section 3.3 of the MVLWB *Engagement Guidelines for Applicants and Holders of Water Licences and Land Use Permits*; and
  - d. Work with Board staff to set a deadline for Version 3.3 of the interim CRP that is no later than June 29, 2020.
2. Add the following closure goal to Version 3.3 of the interim CRP: “to return the mine site and affected areas to viable and, wherever practicable, self- sustaining ecosystems that are compatible with a healthy environment and with human activities”;
3. Review and revise the closure objectives and criteria in Version 3.3 of the interim CRP to be consistent with the Board’s *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories* (Closure Guidelines), and ensure that criteria are described consistently throughout the interim CRP;
4. Identify timeframes in which the closure criteria are to be met in Version 3.3 of the interim CRP;
5. Support the estimated timeframe to meet chemical criteria for the waste rock pile (as required in Decision #6) with a thorough explanation and supporting analysis;
6. Specify that Nighthawk will minimize the quantity/footprint of exposed potentially acid generating (PAG) rock in the portal/decline in Version 3.3 of the interim CRP and consider whether this can be addressed with closure objectives and criteria;
7. Specify that Nighthawk will eliminate the risk of pond overflow in Version 3.3 of the interim CRP, and consider whether this can be addressed with closure objectives and criteria;
8. Propose in Version 3.3 of the interim CRP where closure criteria for Lardass Lake must be met, and provide rationale;

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<sup>2</sup> See WLWB Online Registry for [W2012L1-0002 - Nighthawk - Interim Closure and Reclamation Plan - Version 3.2 - Oct 31 18.pdf](#)

<sup>3</sup> See WLWB Online Registry for [W2012L1-0002 - Nighthawk - ICRP - Version 3.1 - Board Directive and Reasons for Decision - Mar 8 18.pdf](#)

9. Better address the possibility of acute toxicity in Lardass Lake in Version 3.3 of the interim CRP, for example by revising the closure objectives, closure criteria, and/or the proposed closure activity;
10. Clarify in Version 3.3 of the interim CRP where the criteria for rock pile source waters and site drainage will be measured and provide a rationale;
11. Discuss in Version 3.3 of the interim CRP whether ammonia should have closure criteria;
12. Better address in Version 3.3 of the interim CRP the potential for contamination in the drainage path and/or the lake due to metal precipitation;
13. Include the following in Version 3.3 of the interim CRP:
  - a. The information in Nighthawk's response to ENR comment 41;
  - b. An estimate of the maximum amount of material that could be obtained from nearby borrow sources and the cover thickness that could be achieved with this material;
  - c. An assessment of the possibility of quarrying rock with adequate neutralizing potential as additional cover material or buffer material (as suggested in ENR comment 10), potential rock quarry locations, and the associated land disturbance;
  - d. A description of the environmental (e.g., land disturbance for borrow areas and roads, etc.), worker safety, financial, or other costs of obtaining and transporting borrow material; and
  - e. Any other information, in detail, that supports Nighthawk's conclusion that there is insufficient borrow material.
14. Expand and better document the options analysis for waste rock pile closure in Version 3.3 of the interim CRP. The options analysis should include passive wetlands and a geosynthetic liner and address the possibility of quarrying rock. For each option, Nighthawk should include a description of the costs and benefits of each option in relation to important factors such as environment, culture, worker safety, and economics, and provide a transparent description of how each option was evaluated and why it was accepted or rejected;
15. Remove the contingency option of placing waste rock on Damoti Lake from Version 3.3 of the interim CRP, develop a list of possible contingencies (in consideration of different scenarios where criteria are not met), identify Nighthawk's preferred contingency(ies), and provide a rationale for any contingencies rejected by Nighthawk;
16. Incorporate their commitment to test and manage settling pond materials prior to closure into Version 3.3 of the interim CRP;
17. Revise the post-closure monitoring section in Version 3.3 of the interim CRP to reflect the estimated length of time to meet the revised closure criteria;
18. Provide a detailed explanation for each mine component for why long-term maintenance is unnecessary, in consideration of the Board's previous correspondence to Dominion Diamond Mines ULC. (Dominion) and Diavik Diamond Mines (2012) Inc. (DDMI) on this issue;
19. Incorporate the following revisions in Version 3.3 of the interim CRP:
  - a. Revise Table A-4 in Appendix A to indicate when sampling was conducted (ECCC comment 10);
  - b. Replace "cover" with "overlying material" to differentiate the base material from the material overlying it (ECCC comment 11)
  - c. Correct section 2.0 to state that the total volume of waste rock and ore brought to the surface during bulk sampling/exploration was 4,051 m<sup>3</sup> (ENR comment 16);

- d. Update the proposed monitoring program to include dissolved and total metal fractions for monitoring at SNP 5-5 (ENR comment 22);
  - e. Provide a summary of environmental risks to valued ecosystem components (ENR comment 31);
  - f. Incorporate the information contained in Table 2 regarding water quality monitoring into the main body of the interim CRP (ENR comment 38);
  - g. Add a statement that Nighthawk will seek appropriate regulatory approvals prior to the transfer of any rock or ore from Damoti Lake to Colomac for processing (CIRNAC comment 1);
  - h. Add a statement that Nighthawk will remediate legacy drill holes prior to closure, and provide an estimate of the number of legacy drill holes to be remediated (Board staff comment 3); and
  - i. Correct the reference to the waste rock pile photographs, as per Nighthawk's response to Board staff comment 4.
20. Address the following comments as part of Version 3.3 of the interim CRP: ECCC comments 3, and 6; ENR comments 8, 20, 21, 23, 28, 32, 33, and 40; and Board staff comments 2, 14, and 16;
21. Identify where the revisions specified by Decisions #21 and #22 are addressed in Version 3.3 of the interim CRP; and
22. Specify the form and frequency of Nighthawk's engagement specific to closure and reclamation, including plans for upcoming engagement, in Version 3.3 of the interim CRP.

## **2.0 Background**

Nighthawk describes the Damoti Lake site as follows:

Gold exploration was conducted at the Site between 1993 and 1997, including an underground exploration program consisting of a decline and drift. Rock excavated from the underground was stored in piles near the entrance to the underground (the portal)... Other features of the Site include a small settling pond near the waste rock piles, a camp area with several wood-framed tent structures, three large (empty) bulk fuel storage tanks, trails connecting different parts of the Site, and some empty fuel drums and other debris.

Nighthawk Gold Corp (Nighthawk) acquired the lease to the Damoti Site in September 2008, and has been conducting progressive reclamation of the Site since that time. Nighthawk used some of the camp facilities at the Site to support exploration programs before setting up an exploration camp at the Colomac Mine Site (located 27 km north of Damoti). Progressive reclamation activities have included removing fuel drums and debris from the site, emptying three bulk fuel storage tanks, cleaning up and securing structures, excavating and removing heating oil spills from previous Site users, and conducting several scientific studies in support of closure and reclamation planning for the Site.<sup>4</sup>

On October 31, 2018, Nighthawk submitted Version 3.2 of the interim CRP for the Damoti Lake site, as per Part I, Condition 1 of Water Licence W2012L1-0002. Since this submission, the Board has issued Nighthawk with new authorizations. The Land and Water Boards received direction from the territorial government that separate licences should be issued for respective activities on federal and non-federal land, where

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<sup>4</sup> See WLWB Online Registry for [W2012L1-0002 - Nighthawk - Interim Closure and Reclamation Plan - Version 3.2 - Oct 31 18.pdf](#)

previously a single water licence authorized activities across both types of land. The Board issued Nighthawk separate water licences for its respective activities on federal and non-federal land. Version 3.2 of the interim CRP is applicable as per Part I, Condition 1 of Water Licence W2018L2-0003 (for non-federal land, where the Damoti Lake site is located).

Version 3.2 of the interim CRP was distributed for public review on January 2, 2019, with Parties' comments due by March 14, 2019. Comments and recommendations were received by:

- Environment and Climate Change Canada (ECCC)
- Government of the Northwest Territories – Department of Environment and Natural Resources (ENR)
- Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)
- Tlicho Government – Lands Protection Department (TG); and
- Board staff.

Parties' comments were received by the deadline of March 14, 2019, except for ECCC who notified Board staff that their comments would be submitted after the deadline. ECCC submitted their comments on March 15, 2019. Nighthawk requested an extension to the April 4, 2019 deadline for proponent responses, which was granted. Proponent responses were submitted by the revised deadline of April 18, 2019. Parties' comments and recommendations, as well as proponent responses are available on the WLWB Online Registry.<sup>5</sup>

The Board consulted SRK Consultants on issues related to waste rock geochemistry and seepage quality.

### **3.0 Reasons for Decision**

The Board notes that Nighthawk's responses to Parties' comments were thorough and that Nighthawk agreed to incorporate many recommendations from Parties. This approach is beneficial to the closure planning process and contributes to a more efficient and streamlined review process. However, in Version 3.2, fundamental closure planning issues remain unresolved, most notably issues related to the closure objectives and closure criteria for the site, and the closure activity for the waste rock pile. The Board has therefore not approved Version 3.2 of the interim CRP. An explanation of these and other outstanding issues is below, as well as required revisions to bring the interim CRP in line with the Board's expectations, as outlined in the *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories* (Closure Guidelines)<sup>6</sup> and previous Board directives.

- ***Decision #1: The Board has not approved Version 3.2 of the interim CRP.***
- ***Decision #2: The Board requires Nighthawk to submit Version 3.3 of the interim CRP with the revisions described in Decisions #3 to #24.***

The Board notes that the key issues with the waste rock pile closure plan have been ongoing for many years. For example, in its July 28, 2015 letter, the Board stated that "The Board has not approved Version 3.0 of Nighthawk's ICRP because Nighthawk has not selected final closure options for the Damoti site,

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<sup>5</sup> See WLWB Online Registry for [Nighthawk – ICRP V3.2 – Review comments and attachments – May 24 19](#)

<sup>6</sup> See WLWB ([www.wlwb.ca](http://www.wlwb.ca)) 'Policies and Guidelines' webpage for [MVLWB Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories \(2013\)](#)

which was required and the purpose of this update. The Board is concerned with the delay in determining final closure options.”

The Board acknowledges that Nighthawk indicated in interim CRP Version 3.2 that it has expended over \$200,000 to develop and revise the interim CRP and has made progress on the key issues. However, Nighthawk does not yet have a set of approved closure objectives for the site (see section 3.1 of the Reasons for Decision), which may continue to hamper closure planning progress. Also, significant issues with respect to the waste rock piles remain outstanding, as discussed in section 3.2 of the Reasons for Decision. Nighthawk should attempt in Version 3.3 of the interim CRP to obtain approval of closure objectives and resolve the main outstanding issues related to the waste rock piles.

Key to achieving this is engagement with all Parties. Meaningful and thorough engagement could contribute to consensus on closure objectives and resolution of outstanding issues related to the waste rock piles. Engagement on closure criteria should also help Nighthawk to refine them. Therefore, the Board requires Nighthawk to engage on these issues prior to submission of Version 3.3 of the interim CRP.

Nighthawk should work with Board staff to select an appropriate deadline for Version 3.3 of the interim CRP. The deadline should be no more than one year from the date of this decision, and ideally sooner. One year is a reasonable period to allow effective engagement, while ensuring progress on the outstanding issues. Although this additional delay is not ideal, providing additional time to Nighthawk should increase the quality of the submission and reduce inefficiencies and undue burden on Parties and the Board.

➤ ***Decision #3: Regarding closure objectives and engagement:***

- a. Nighthawk is to work towards approval of closure objectives for the site and the closure activity for the waste rock piles in Version 3.3 of the interim CRP;***
- b. Nighthawk is to engage with all Parties on closure objectives and criteria for the site and the closure activity for waste rock piles;***
- c. Nighthawk is to submit an engagement log as described in Section 3.3 of the MVLWB Engagement Guidelines for Applicants and Holders of Water Licences and Land Use Permits; and***
- d. Nighthawk is to work with Board staff to set a deadline for Version 3.3 of the interim CRP that is no later than June 29, 2020.***

### **3.1 Closure Goal, Objectives and Criteria**

#### **3.1.1 Closure Goal**

ENR commented that Nighthawk does not specifically state what the goal of the interim CRP is, and referred to the requirements in the Closure Guidelines (ENR comment 2). The Closure Guidelines describes the closure goal as the following:

The closure goal is the guiding statement and starting point for closure and reclamation planning. The closure goal at all mining operations is to return the mine site and affected areas to viable and, wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment and with human activities. Proponents can add to this goal, provided they maintain or improve the reclamation standard expressed in the goal and have discussed the change with stakeholders.

The development of a CRP needs to follow an objectives-based approach with the overarching closure goal at its foundation; this will allow closure planning to be more coordinated and consistent for an advanced mineral exploration project progressing toward the development of a mine. The closure goal is supported by closure principles which guide the selection of clear and measurable closure objectives for all project components.<sup>7</sup>

The interim CRP should have a closure goal to be consistent with the Closure Guidelines and to guide the closure planning process.

- **Decision #4: Nighthawk is to add the following closure goal to Version 3.3 of the interim CRP: “to return the mine site and affected areas to viable and, wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment and with human activities”.**

### **3.1.2 Closure Objectives and Criteria**

As per the Board’s Closure Guidelines, the closure objectives are “statements that clearly describe what the selected closure activities aim to achieve. They must be measurable, achievable, and allow for the development of closure criteria”.<sup>8</sup> In turn, closure criteria should “measure whether the selected closure activity achieves the specific closure objective”.<sup>9</sup> The Board has previously directed Nighthawk to provide clear, measurable criteria for closure objectives,<sup>10</sup> to conduct further engagement to finalize closure options and criteria,<sup>11</sup> and to finalize closure criteria for the site through engagement efforts.<sup>12</sup> While Nighthawk has revised both closure objectives and criteria in interim CRP Version 3.1, Parties do not agree with all of the objectives and criteria, and some closure objectives and criteria do not meet the Board’s Closure Guidelines.

ENR noted that some of Nighthawk’s closure objectives are inconsistent with the Board’s Closure Guidelines (ENR comment 3). For example, ENR stated Nighthawk’s closure objective for chemical stability for buildings and equipment describes “a closure activity and does not address the water quality standard that the closure activity will aim to achieve”. ENR recommended that Nighthawk “review the proposed closure objectives and ensure they are consistent with the definition of closure objectives in the guidelines”. Nighthawk responded that they would review the closure objectives to be consistent with the definitions in the Guidelines.

ENR also recommended that Nighthawk “review the closure criteria to ensure criteria are set at a standard that will achieve the closure objective” (ENR comment 4). ENR noted that some of the proposed closure criteria do not follow the definition of closure criteria as set in the Board’s Closure Guidelines. For example, the closure criteria for physical stability of the settling pond is “Settling pond back-filled or regraded”, which ENR noted “are closure options, not criteria”. ENR recommended Nighthawk “review the closure criteria and ensure they are consistent with the definition of closure criteria” in the Closure

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<sup>7</sup> See WLWB ([www.wlwb.ca](http://www.wlwb.ca)) ‘Policies and Guidelines’ webpage for [MVLWB Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories \(2013\)](#)

<sup>8</sup> *Ibid.*, p.15.

<sup>9</sup> *Ibid.*, p.15.

<sup>10</sup> See WLWB Online Registry for [W2010L2-0001 - Nighthawk - Damoti Lake FCRP - Version 1 - Board Directive - Jun 15 12.pdf](#)

<sup>11</sup> See WLWB Online Registry for [W2012L1-0002 - Nighthawk - Damoti Site - ICRP - Board Decision Package - Feb 28 13.pdf](#)

<sup>12</sup> See WLWB Online Registry for [W2012L1-0002 - Nighthawk - ICRP - Version 3.0 - Board Decision Package - Jul 28 15.pdf](#)

Guidelines (ENR comment 5). In response to ENR (comments 4 and 5), Nighthawk stated the closure criteria would be reviewed in light of the closure objectives and definitions in the Closure Guidelines.

Nighthawk should review and revise the closure objectives and criteria as per the Closure Guidelines. Nighthawk should consult Part 1, section 1.1 and Part 3, section 3.3 of the Closure Guidelines for guidance with this task. The Board also notes that the criteria proposed in interim CRP Version 3.2 are not always consistent throughout the document. For example, waste rock pile water quality criteria on page 41 do not match criteria in Tables 9 and 14 (additional discussion on closure criteria for waste rock is in section 3.2 of the Reasons for Decision).

- ***Decision #5: Nighthawk is to review and revise the closure objectives and criteria in Version 3.3 of the interim CRP to be consistent with the Board's Closure Guidelines, and ensure that criteria are described consistently throughout the interim CRP.***

### ***3.1.3 Timeframes to Meet Closure Criteria***

ENR noted that Tables 7 through 11 outline the closure principles, objectives, criteria and timelines for each remaining component on-site, and that it was not clear what the column "timeline" was meant to represent. ENR stated that:

To coincide with the closure principles, objectives and criteria, ENR's preference would be for the timeline to outline the timeframe required to ensure closure criteria have successfully been achieved, i.e. the monitoring time period. Then, the length of time the objective is projected to be achieved should be included in the rationale for selecting each preferred closure option. (ENR comment 6)

ENR also recommended that Nighthawk "ensure the length of time the objective is projected to be achieved is included in the rationale for selecting each preferred closure option" (ENR comment 7). Nighthawk responded stating they would incorporate ENR's recommendation into the next version of the interim CRP in Tables 7 to 11, with the Timeline column to indicate the "expected time the option will take to meet closure criteria, and hence the duration of monitoring to be required for that site component".

The Board agrees with ENR's recommendation that Tables 7 through 11 should identify the anticipated length of time to meet closure criteria. This is consistent with the Closure Guidelines, which state "Closure criteria may have a temporal component (e.g. a standard may need to be met for a pre-defined number of years)". As noted by Nighthawk in its response to ENR comment 6, including this timeframe will also allow an estimate of the monitoring period. This in turn will support the closure cost estimate.

- ***Decision #6: Nighthawk is to identify timeframes in which the closure criteria are to be met in Version 3.3 of the interim CRP.***

To achieve the requirement in Decision #6 as it relates to the waste rock pile water quality criteria, Nighthawk may need to estimate how long acidic drainage and elevated metals will persist. In its March 8, 2018 decision,<sup>13</sup> the Board required Nighthawk to estimate this timeframe. Nighthawk responded in interim CRP Version 3.2 that "[p]redicted effects in the receiving environment (Lardass Lake) are

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<sup>13</sup> See WLWB Online Registry for [W2012L1-0002 - Nighthawk - ICRP - Version 3.1 - Board Directive and Reasons for Decision - Mar 8, 18.pdf](#)

considered within an acceptable range given model results”. ENR pointed out that Nighthawk did not estimate the length of time and recommended that Nighthawk add more discussion on this topic (ENR comments 24 to 26). In response, Nighthawk stated that post-closure monitoring would be conducted and that closure would not be considered complete until criteria are met. Nighthawk also referred to some of the geochemical data and stated that “lab testing indicates sulphide depletion in 2-3 years”, although Nighthawk did not present an analysis of the data to estimate a length of time. It is not uncommon for acid rock drainage (ARD) and metal leaching to persist for decades or centuries.

- ***Decision #7: Nighthawk is to support the estimated timeframe to meet chemical criteria for the waste rock pile (as required in Decision #6) with a thorough explanation and supporting analysis.***

#### **3.1.4 Portal and Decline Closure Objective**

A portal cut and decline ramp were previously created for bulk ore sampling at Damoti. Nighthawk is proposing to close the portal and decline by blasting approximately 22 meters of the decline and backfilling the portal. ENR noted that this is an acceptable plan, and further stated that “if this means reducing the extent of blasting along the decline, this may be acceptable given the balance of risk of failure versus increased surface disturbance, exposure of fresh rock surfaces and opening up new flow paths” (ENR comment 42). ENR recommended that Nighthawk’s closure plan for the portal and decline ramp reduce the quantity/footprint of exposed PAG rock to the extent possible (ENR comment 42). Nighthawk responded agreeing with ENR’s statement and that this is the intent of the design. Nighthawk should specify its intention to minimize the quantity/footprint of exposed PAG rock in the portal/decline in the interim CRP. Nighthawk should consider whether this could be addressed with closure objectives and criteria, as part of its efforts to address Decision #5.

- ***Decision #8: Nighthawk is to specify that it will minimize the quantity/footprint of exposed PAG rock in the portal/decline in Version 3.3 of the interim CRP and consider whether this can be addressed with closure objectives and criteria.***

ECCC also noted that the interim CRP suggests overflow from the portal may be possible during periods of high precipitation, and that Nighthawk “has not demonstrated that there will be no overflow out of the portal, or how it will be mitigated if there is one” (ECCC comment 13). ECCC stated that water from the portal could potentially be deleterious and it is unclear whether this could potentially enter fish-bearing waters, or whether there is a contingency plan to accommodate or manage portal overflow if it happens. ECCC recommended Nighthawk provide a plan to manage overflow from the portal during high precipitation periods if there is the potential for overflow to enter fish-bearing waters (ECCC comment 13). Nighthawk responded that the proposed closure approach would eliminate this risk, that the material would be graded to mitigate against ponding in the former portal, and that Nighthawk would add a statement clarifying the design in the next version of the interim CRP. The Board believes that Nighthawk should specify its intention to eliminate the risk of portal overflow in the interim CRP. Nighthawk should consider whether this could be addressed with closure objectives and criteria, as part of its efforts to address Decision #5.

- ***Decision #9: Nighthawk is to specify that it will eliminate the risk of pond overflow in Version 3.3 of the interim CRP, and consider whether this can be addressed with closure objectives and criteria.***

### 3.2 Waste Rock Piles

The preferred closure activity for the waste rock piles has been outstanding for several years and is arguably the most significant closure issue at the Damoti Lake site. In early versions of the interim CRP (Versions 2.0 and 3.0),<sup>14 15</sup> Nighthawk indicated that if water quality were shown to be acceptable, the waste rock piles would be left in place, otherwise, the piles would be consolidated and covered with a geomembrane or soil cover. After reviewing Version 3.0 of the interim CRP, the Board stated that it was concerned with the delay in selecting the preferred closure activity and required Nighthawk to resolve the issue by completing a borrow source investigation and predicting future water quality.

In Version 3.1 of the interim CRP, Nighthawk proposed that there would be no cover on the waste rock, but that the piles would be consolidated into one pile, with the most PAG material in the center. This proposal was informed by the company's conclusion from their borrow investigation that there is not enough material to build a cover.

After reviewing Version 3.1, the Board did not approve the Plan, stating the primary reason for this was that "Nighthawk did not present enough information to support its closure option for the waste rock pile."<sup>16</sup> The Board concluded that Nighthawk had proposed a closure activity that would not meet its proposed water quality closure criteria. The Board required Nighthawk to submit more detail regarding the borrow source investigation, the water quality results, and the predicted impacts along the flow-path between the rock piles and Lardass Lake.

In interim CRP Version 3.2, Nighthawk maintained that there is no viable borrow source within a practical distance to the site (see section 4.5 of the interim CRP for a discussion on material availability) and continued to propose that the rock piles be consolidated into a single pile with the most acid-generating material at the center, and that no cover be placed on top. Nighthawk states that this will increase the overall chemical stability of the pile, result in a smaller footprint, and reduce the amount of water coming into contact with the rock pile. Nighthawk proposes to grade the pile consistent with the surrounding landscape and ensure physical stability. Nighthawk provided new water quality predictions based on modeling conducted by Golder Associates Inc, as discussed in section 3.2.1 of the Reasons for Decision.

Regarding the physical stability of the planned consolidated pile, ENR stated in its comments on Version 3.2 that it agrees with the conclusions of the proponent's stability analysis (conducted by Golder) and has no concerns with physical stability (ENR comment 39).

The main concern with the waste rock piles at the Nighthawk site is long-term water quality. In interim CRP Version 3.2, Nighthawk compared predictions from the water quality model to its proposed closure criteria (which are not approved). Nighthawk proposed the following criteria:

Criteria for Site Drainage - rock pile source waters and water quality in site drainage will meet:

- guidelines for wildlife drinking water quality (Canadian Council of Ministers of the Environment (CCME) livestock guidelines); and
- acute water quality guidelines for the protection of aquatic life.

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<sup>14</sup> See WLWB Online Registry for [W2012L1-0002 - Nighthawk - Damoti Site - ICRP - Board Decision Package - Feb 28 13.pdf](#)

<sup>15</sup> See WLWB Online Registry for [W2012L1-0002 - Nighthawk - ICRP - Version 3.0 - Board Decision Package - Jul 28 15.pdf](#)

<sup>16</sup> See WLWB Online Registry for [W2012L1-0002 - Nighthawk - ICRP - Version 3.1 - Board Directive and Reasons for Decision - Mar 8 18.pdf](#)

Criteria for Lardass Lake - water quality in Lardass Lake will meet:

- chronic water quality guidelines for the protection of aquatic life; and
- guidelines for wildlife drinking water quality (CCME livestock guidelines).

Based on Golder's water quality modeling, Nighthawk predicted that their proposed closure criteria would be met. The Parties commented on the water quality model and expressed concerns about chronic toxicity, acute toxicity, and soil and sediment quality. These issues are discussed below, followed by a discussion about the preferred closure activity for the waste rock piles.

### **3.2.1 Water Quality Model**

In response to the Board's requirement to update water quality predictions, Nighthawk hired Golder to model waste rock pile seepage and runoff water quality. There were several comments on the water quality model inputs and assumptions, including the following:

- ENR questioned why data from SNP station 5-5 (which appears to be approximately 50 meters west of the discharge point) was used as baseline data (ENR comment 18). Nighthawk explained that baseline in this case does not mean background levels, rather it represents the current water quality of the lake.
- ENR recommended that the post-closure modeling include a worst-case scenario based on the first flush humidity cell test results (ENR comment 19). Nighthawk responded that it completed modeling in 2016 based on a worst-case scenario, although it did not elaborate on its conclusions from the 2016 exercise. The 2016 results may not be directly comparable to the results of the new modeling. However, the first flush results are not dramatically different than steady state results, and, in the Board's view, the inputs to the model are reasonably conservative.
- ENR recommended a sensitivity analysis to determine the results if less metal precipitation and more water infiltration is assumed (ENR comment 29). Nighthawk responded that more infiltration had already been modeled and that it is not reasonable to assume there will be no precipitation. The Board agrees with Nighthawk's response, noting that predictions for runoff versus seepage both have reasonably conservative source terms reflecting interaction with PAG rock, so a scenario that considers 100% infiltration may not be very different from the one modeled. In the Board's view, the model assumptions regarding precipitation are reasonable, specifically the assumptions regarding secondary mineral phases and pH conditions.
- ENR and ECCC noted that comparing modeled concentrations of dissolved metals to CCME guidelines for total metals creates some uncertainty (ECCC comment 6 and ENR comment 20). Nighthawk indicated that the difference between dissolved and totals concentrations would not change the conclusions drawn from the modeling exercise, and that guidelines for dissolved metals would be used, where possible. The Board has required that Nighthawk's responses be incorporated into interim CRP Version 3.3 (see Decision #22).

Overall, the modelling approach, inputs and results appear to be reasonable, and the Board concluded that the predicted results are a reasonable indication of future water quality that could be expected from the site. Regardless, at this stage, re-running the model with more conservative estimates may not have a bearing on the conclusions regarding the closure activity for the waste rock piles, given that in the Board's view, Nighthawk has not demonstrated that the predicted water quality is acceptable, as discussed in the following sections of the Reasons for Decision (sections 3.2.2 and 3.2.3).

### 3.2.2 Chronic Toxicity Concerns

Nighthawk first proposed CCME chronic toxicity guidelines as closure criteria in its responses to comments on Version 3.1 of the interim CRP. The Board did not approve any of Nighthawk's proposed closure criteria and concluded that it was unclear where the proposed criteria would be measured. To ensure all parties have a common understanding, the Board required Nighthawk to clarify approximately where water would be sampled to compare to closure criteria. Interim CRP Version 3.2 continues to present contradictory information on this issue:

- In the compliance table (Table 2) that summarizes how Nighthawk met the Board's requirement, Nighthawk stated that "Water quality monitoring will continue at SNP 5-14 on the flow path, and SNP 5-4 and SNP 5-5 at the northern edge of Lardass Lake." Each of these locations has potential issues:
  - SNP 5-4: As shown in Figure 1, SNP station 5-4 is where the site drainage enters Lardass lake. At this location, CCME chronic guidelines will not be met for several parameters. Despite this, Nighthawk concluded that closure criteria for Lardass Lake will be met. This was based on a comparison of the CCME chronic guidelines to the predicted concentrations in a fully mixed lake. It is unclear why Nighthawk used the predictions for a fully mixed lake to determine whether closure criteria are met.
  - SNP station 5-5: In its response to comments, Nighthawk identifies this location as its preferred location for meeting CCME chronic guidelines (responses to ENR comments 17 and 30, ECCC comment 4, and WLWB staff comment 8). However, it is not clear how much mixing will have occurred at SNP station 5-5 which appears to be approximately 50 meters from where the site drainage enters the lake. Regardless, if criteria were assessed at SNP station 5-5, this would mean that criteria could be met even if there are concentrations above CCME chronic guidelines between the discharge location and SNP station 5-5. Nighthawk provided no rationale for this approach.
  - SNP station 5-14: this station is relevant to closure criteria for site drainage (as opposed to Lardass Lake) and is discussed in section 3.2.3 of the Reasons for Decision.
- In some instances, the interim CRP states that CCME chronic guidelines will be met "in" Lardass Lake (e.g., Table 2), although no specific location is provided in these instances. In other cases (e.g., Table 9) Nighthawk indicates that criteria will be met at the outlet of Lardass Lake. If the criteria were assessed at the lake outlet, this would mean that criteria could be met even if there are concentrations in other parts of the lake above CCME chronic guidelines, as noted by ECCC (comment 4). No rationale is provided for this approach and it is unclear how this would be consistent with the *MVLWB Water and Effluent Quality Management Policy* (the Policy)<sup>17</sup> which states that: "protection of water quality in the receiving environment is the primary objective. The level of protection will be defined by the water quality standards that have been set site-specifically for the receiving environment in question." It is the Board's understanding that Nighthawk is effectively proposing that the water quality standards (or water quality objectives; WQOs) for Lardass Lake be the CCME chronic guidelines, but that the predicted water quality will not meet these standards.

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<sup>17</sup> See WLWB ([www.wlwb.ca](http://www.wlwb.ca)) 'Policies and Guidelines' webpage for [MVLWB Water and Effluent Quality Management Policy \(2011\)](#).

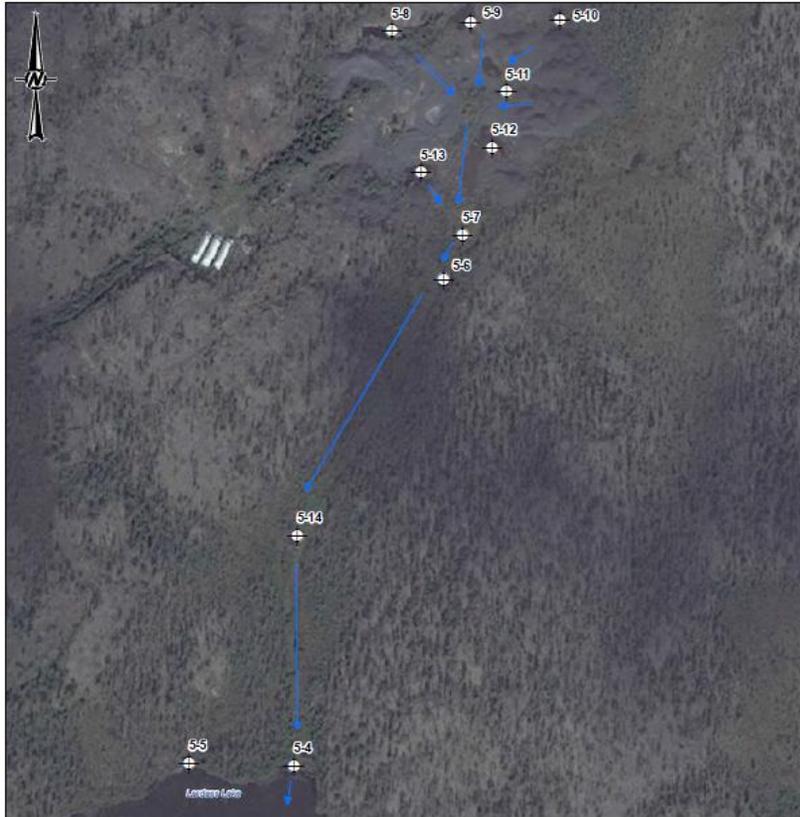


Figure 1. Map of SNP Stations (Lardass Lake is shown in the bottom (south) of the photo.)

The *MVLWB/GNWT Guidelines for Effluent Mixing Zones* (the Mixing Zone Guidelines)<sup>18</sup> speak to the issue of where water quality objectives (WQOs) should be met:

Although the Policy does not specify the location within the receiving environment that WQOs must be met, it does state that “on a case-by-case basis, the Boards may decide to define a mixing zone between the point of effluent discharge and the point at which water quality standards need to be met.” Used in this way, defined ‘mixing zones’ become areas of the receiving water body that may have [contaminants of potential concern] concentrations that are greater than the respective WQOs. For this reason, there must be a careful consideration of 1) whether it is appropriate or necessary to allow a mixing zone at all for a specific undertaking; and 2) what conditions must be met if a mixing zone is to ensure that the receiving water body is protected to a level that is acceptable to potentially affected parties.

Nighthawk has not proposed a mixing zone, although ENR recommended one (ENR comment 17) and provided input on mixing zone requirements (ENR comment 30). In order to propose a mixing zone, the company would need to demonstrate that the decision criteria for allocating regulated mixing zones are met, as described in Section 3 of the Mixing Zone Guidelines, and provide the information outlined in Section 6 of the Guidelines.

<sup>18</sup> See WLWB ([www.wlwb.ca](http://www.wlwb.ca)) ‘Policies and Guidelines’ webpage for [MVLWB/GNWT Guidelines for Effluent Mixing Zones \(2017\)](#)

However, one of the two objectives in the Policy is that “[t]he amount of waste to be deposited to the receiving environment is minimized. The Boards expect proponents to identify and implement waste prevention and/or minimization measures, whenever feasible.” The Mixing Zone Guidelines echo this concept: “Mixing zones must not be used as an alternative to reasonable and practical pollution prevention practices, including wastewater treatment.” This leads to the question of whether Nighthawk’s proposed closure activity for the waste rock piles is acceptable, as discussed in section 3.2.5 of the Reasons for Decision.

In summary, interim CRP Version 3.2 contains contradictory statements about where the closure criteria for Lardass Lake must be met. This is an important issue to resolve because the location directly influences Nighthawks’ ability to meet closure criteria, which in turn can drive the need for a different closure activity.

- ***Decision #10: Nighthawk is to propose in Version 3.3 of the interim CRP where closure criteria for Lardass Lake must be met, and provide a rationale.***

### **3.2.3 Acute Toxicity Concerns**

One of Nighthawk’s proposed closure criteria for site drainage is that the drainage meets CCME acute water quality guidelines for the protection of aquatic life. All of the predicted concentrations meet CCME acute thresholds; however, as noted by ENR (comment 35) and ECCC (comment 5), some parameters, most notably aluminum and pH, do not have acute toxicity thresholds. ENR explained the issue as follows (ENR comment 35):

The lack of CCME acute guidelines does not imply that these parameters are not of concern during short-term (i.e., acute) exposures. The intent of the closure criteria (Section 4.6.3.2) are to protect against acute lethality to aquatic life exposed to the site discharge. Based on a review of the water quality predictions, it is very unlikely that the seepage conveyed along the drainage channel (i.e., flow path) would pass acute lethality toxicity tests considering that the pH of the effluent is 3.5 and aluminum concentrations are predicted to be around 3400 µg/L.

ENR cited literature supporting its view that the predicted pH and aluminum concentrations would be acutely toxic. ENR recommended that the Board not accept the proposed closure criteria unless Nighthawk can demonstrate that the water will not be acutely toxic, through toxicity testing with site water amended to simulate expected seepage water.

Nighthawk did not address ENR’s specific evidence in the literature that predicted aluminum and pH concentrations would be acutely toxic but noted that the CCME acute toxicity limits are conservative. However, since there are no acute toxicity limits for pH (in freshwater) and aluminum, it is unclear how conservative acute toxicity guidelines for the other parameters is relevant. Nighthawk also responded that site discharge is affected by numerous biophysical processes and would be difficult to replicate in a laboratory setting. Nighthawk indicated that it would evaluate the necessity for acute toxicity testing if any of the proposed criteria are not met, in other words, based on post-closure monitoring. Nighthawk’s proposal to conduct toxicity testing after closure, despite the evidence presented by ENR that the seepage water quality may be acutely toxic, could result in selection of a closure activity that does not prevent acute toxicity.

In response to ECCC's concerns about acute toxicity, Nighthawk stated that it would update the criteria as follows:

1. For parameters with acute guidelines for the protection of aquatic life, these guidelines will be used as water quality criteria since they are lower than other guidelines/limits;
2. For parameters with a wildlife guideline or Water Licence limit, the lower of the two will be used as water quality criteria;
3. Other parameters with no guidelines or limits are not considered parameters of concern and will not have water quality closure criteria assigned.

It is unclear how Nighthawk's proposal would address the issue that seepage may be acutely toxic due to aluminum and pH, which have no CCME acute toxicity guidelines. This may point to a shortcoming with the closure objective, which is: "reduction in long-term potential for acid rock drainage and metals leaching". ECCC noted that the closure objective is not protective of the aquatic receiving environment and recommended that it be revised (ECCC comment 4).

In summary, Nighthawk has not sufficiently addressed reviewer concerns regarding acute toxicity of site drainage. This could require an update to the closure objective (for example to ensure that site drainage is not acutely toxic), a revision to the criteria, a change in the preferred closure activity, or some combination thereof.

- ***Decision #11: Nighthawk is to better address the possibility of acute toxicity in Lardass Lake in Version 3.3 of the interim CRP, for example by revising the closure objectives, closure criteria, and/or the proposed closure activity.***

Similar to the discussion on where criteria for Lardass Lake should be measured (section 3.2.2 of the Reasons for Decision), the location where criteria for site drainage are assessed is also important. Based on its response to the Board's requirement to clarify this location, Table 2 of interim CRP Version 3.2 appears to propose that site discharge criteria be assessed at SNP station 5-14. This station is partway between the rock piles and the lake (see Figure 1). However, if metals precipitate along the pathway to the lake, concentrations of dissolved metals in the drainage will decrease as water moves down the pathway (see section 3.2.4 of the Reasons for Decision for a discussion on metals precipitation. Dilution from water in the catchment area may also reduce concentrations. Therefore, Nighthawk's proposal to measure site drainage criteria at SNP station 5-14 (partway down the drainage page as shown in Figure 1) may not ensure criteria are met above that station.

- ***Decision #12: Nighthawk is to clarify in Version 3.3 of the interim CRP where the criteria for rock pile source waters and site drainage will be measured and provide a rationale.***

Finally, the Board notes Nighthawk has not proposed closure criteria for ammonia, although ammonia has an EQC in Nighthawk's Water Licence. Nighthawk does not explain the exclusion of ammonia in the interim CRP Version 3.2.

- ***Decision #13: Nighthawk is to discuss in Version 3.3 of the interim CRP whether ammonia should have closure criteria.***

### **3.2.4 Sediment and Soil Quality Concerns**

ENR also raised concerns that metals that precipitate out of the site drainage may contaminate either the drainage path between the waste rock piles and the lake, or contaminate sediments in the lake, depending on where they fall out (ENR comment 27). Nighthawk responded that precipitation, although predicted in the water quality model, will happen very near the pile. However, Nighthawk did not provide the basis for this and it is unclear whether pH may change further downstream, which would mean that metals could precipitate in the drainage path and/or lake.

In response to a similar question by Board staff (comment 3), Nighthawk responded that:

Limited sediment quality data are available for Lardass Lake. However, given that contact water (consolidated rock pile runoff and seepage) will comprise <1.4% of the total lake balance, precipitation of metals from Site Discharge [is] anticipated to have limited or negligible effects on sediment quality in the lake and sediment monitoring is not proposed as part of the SNP.

It is unclear how the potential metal load to sediment over time relates to the ratio of contact water to lake volume, since dilution will affect the water quality not sediment quality.

Nighthawk's responses do not address concerns about drainage path or lake sediment contamination. The Board therefore agrees with ENR's recommendation that "Nighthawk provide additional details in relation to the predicted precipitate formation, specifically if the expected location of precipitate formation can be predicted and the potential impacts and management strategies."

- ***Decision #14: Nighthawk is to better address in Version 3.3. of the interim CRP the potential for contamination in the drainage path and/or the lake due to metal precipitation.***

### **3.2.5 Preferred Closure Activity for the Waste Rock Piles**

In interim CRP Version 3.2, Nighthawk maintains that the water quality predictions support the company's proposed plan to consolidate the waste rock piles into one pile and place higher PAG at the center, with no cover. ECCC and ENR disagree:

- ECCC noted that Lake Chub have been captured in Lardass Lake and that subsection 36(3) of the Fisheries Act states that, unless authorized by federal regulation, no person shall deposit or permit the deposition of any deleterious substance of any type in water frequented by fish. ECCC recommended that "the Proponent reevaluate the proposed waste rock closure method of using PAG material (i.e., metasediments) to encapsulate higher PAG waste rock" (ECCC comment 2). Nighthawk responded that the model predictions are conservative and provided specific examples to illustrate its point.
- ENR stated that it does not support Nighthawk's proposed waste rock pile closure activity and summarized their opinion as follows:
  - "... the proposed consolidation and layering of the waste rock is likely to result in short term metal release rates that are higher than presently observed in the existing water quality monitoring dataset. The results for long-term water quality model predictions for discharge water are also shown to be poor. As well, it is unclear in the ICRP if other closure

options to optimize the consolidated waste rock pile have been considered to reduce the risk of environmental impact post-closure.” (ECCC comment 10)

ENR listed other options, including quarrying rock to produce cover or buffer material, engineered wetlands, and, ENR’s preferred option: a geosynthetic cover (ENR comment 11). ENR identified the benefits of a geosynthetic liner, including environmental protection, reduced long-term monitoring, and reduced waste rock handling costs since layering would not be necessary. ENR recognized that there may be a lack of suitable material to place over the geosynthetic liner, but provided some possible solutions, including quarrying rock. (ENR comment 10).

Nighthawk disagreed, stating that their modelling and analysis “does not indicate a strong technical driver for the further environmental disruption that would be generated in the area by blasting and quarrying more rock to generate new cover material, or the cost of implementing a geosynthetic liner.” Nighthawk commented that:

“while the incorporation of a geosynthetic liner would provide an extraordinarily high degree of isolation for the consolidated waste rock, a strong technical driver for this degree of isolation is not present, and fine-grained borrow material (not available locally) would still be required for the cover construction. Even a robust geosynthetic placed as a cover would require fine-grained soil placed above and below as a protective layer.”

Also, in their response, Nighthawk agreed to incorporate a passive wetlands treatment system as a contingency measure.

An important consideration for the waste rock pile closure activity is the availability of borrow material for a cover. Borrow material is required whether the cover is synthetic or not; a geosynthetic liner typically requires material beneath it as a bed and overlying it to protect it. This issue has been unresolved for some time. After reviewing Version 3.0 of the interim CRP, the Board required Nighthawk to complete a borrow source investigation to determine whether borrow material is available. Nighthawk completed the investigation and in Version 3.1 concluded that “no viable borrow source is available within a practical distance to the Site” and therefore ruled out the possibility of a cover on the waste rock. Nighthawk did not provide a report to support its conclusion, and in its decision on interim CRP Version 3.1, the Board required specific details about the borrow source investigation to better support Nighthawk’s conclusion.<sup>19</sup>

Nighthawk provided additional information in Version 3.2 of the interim CRP on the methodology and findings of the investigation. ENR commented that the additional information “lacks sufficient detail to have confidence in the results and the conclusion that further investigation is unlikely to identify viable borrow sources. These details are important as they determine whether a cover is a possible closure option for the waste rock pile” (ENR comment 41). ENR identified that Nighthawk omitted desktop study selection criteria, a rationale for a minimum cover thickness of 0.6 m, and the estimated material quantities in certain areas. Nighthawk provided detail on these issues in their response to ENR’s comment; however, Parties have not had the opportunity to evaluate the information. Given that borrow material availability is a critical consideration for finalizing the closure activity for the waste rock piles, Nighthawk should provide this information in Version 3.3 of the interim CRP, along with any other relevant

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<sup>19</sup> See WLWB Online Registry for [W2012L1-0002 - Nighthawk - ICRP - Version 3.1 - Board Directive and Reasons for Decision - Mar 8 18.pdf](#)

information to ensure the Board and all Parties have a detailed and thorough description of material availability.

- **Decision #15: Nighthawk is to include the following in Version 3.3 of the interim CRP:**
- a. The information in Nighthawk's response to ENR comment 41;**
  - b. An estimate of the maximum amount of material that could be obtained from nearby borrow sources and the cover thickness that could be achieved with this material;**
  - c. An assessment of the possibility of quarrying rock with adequate neutralizing potential as additional cover material or buffer material (as suggested in ENR comment 10), potential rock quarry locations, and the associated land disturbance;**
  - d. A description of the environmental (e.g., land disturbance for borrow areas and roads, etc.), worker safety, financial, or other costs of obtaining and transporting borrow material; and**
  - e. Any other information, in detail, that supports Nighthawk's conclusion that there is insufficient borrow material.**

Given that the possibility of a cover has not been ruled out, the water quality concerns above, and the incomplete state of the closure objectives and criteria for the waste rock piles, Nighthawk has not adequately justified its proposed closure activity for the waste rock piles. While a geosynthetic liner would significantly improve waste rock pile seepage/runoff water quality, it is unclear whether there is enough aggregate material to build the cover (from quarried rock or unconsolidated borrow sources). Also, there are costs and benefits related to the options for closure of the waste rock piles. ENR commented on these options:

[S]hould Nighthawk wish to pursue closure options for the waste rock piles other than a geosynthetic cover. . . ENR recommends a full options analysis be conducted. This should include the findings of any such considerations and rationale for why a closure option was, or was not, selected as the preferred option (ENR comment 12).

Nighthawk responded to ENR as follows:

The closure design process included consideration of a range of closure options for the waste rock piles, including a variety of cover options. This consideration took into account the size and location of the site, construction logistics, and potential environmental impacts. Due to the site's small size and remote location, many options are not practical. Due to the small scale of the site, a full options analysis report was not generated as part of the design process.

A transparent, well-executed and thoroughly explained options analysis will allow all Parties to have the same information and weigh the pros and cons of each option with all of the information. While Nighthawk has included some information on its options analysis in Table 14 of interim CRP Version 3.2, the analysis does not include a geosynthetic liner, the possibility of quarrying additional material, or constructed wetlands. Also, the analysis is based on whether or not each option meets Nighthawk's proposed criteria and therefore would not be able to distinguish between two options that meet all criteria. At least in part, this is because it does not include information about the various factors (e.g., water quality, land disturbance, worker safety, etc.) that may need to be considered to select the best closure option. A more rigorous and transparent approach would include a description of each option's

costs and benefits related to factors such as the environment (including water and land considerations), culture, worker safety, and economics.

If done well, options analyses can have long-term benefits by building understanding amongst all Parties, increasing the chances for consensus, and creating a record that all Parties can use in the future when evaluating closure and reclamation of the waste rock piles. At this time, the Board does not support Nighthawk's proposed closure activity for the waste rock piles and requires Nighthawk to provide more information regarding the options analysis.

- ***Decision #16: Nighthawk is to expand and better document the options analysis for closure of the waste rock piles in Version 3.3 of the interim CRP. The options analysis must include passive wetlands and a geosynthetic liner and address the possibility of quarrying rock. For each option, Nighthawk must include a description of the costs and benefits of each option in relation to important factors such as environment, culture, worker safety, and economics, and provide a transparent description of how each option was evaluated and why it was accepted or rejected.***

### **3.2.6 Contingency Options**

Nighthawk's proposed contingency plan is for the waste rock to be transferred on to Damoti Lake during ice-covered conditions and allow it to sink to the lake bottom during ice-break-up.

ENR stated that "significant concern with this contingency option remains and a risk assessment should be completed before this can be considered a viable contingency option and part of an approved ICRP. This is further justified given it is the only contingency option proposed by Nighthawk for the waste rock pile" (ENR comment 13). ENR further stated that it was unclear whether other contingency options had been considered. ENR recommended the Board not approve this contingency option due to the high uncertainty and risk, and that once the appropriate assessments and regulatory approvals have been completed, that the contingency should be reviewed for approval. Nighthawk responded that this option would be removed from the interim CRP.

In the Board's March 8, 2018 Reasons for Decision on Version 3.1 of the interim CRP, the Board commented on Nighthawk's proposed contingency of depositing waste rock in Damoti Lake:

The list of contingencies is useful to reviewers and the Board for understanding the alternatives if a closure plan is no longer viable or preferred and provides useful context when evaluating a closure plan. Inclusion on the list of contingencies does not mean that the proponent has all of the necessary regulatory approvals to undertake a given contingency.

The Board required Nighthawk to include text in Version 3.2 of the interim CRP stating "regulatory approval would be required before implementing this contingency option and further assessments of the risks to the aquatic environment may be required".<sup>20</sup> Nighthawk included this text in Version 3.2 of the interim CRP.

As per the Board's Closure Guidelines, "the proponent must describe what it will do if it becomes apparent that the selected closure activity will not be successful in meeting closure criteria and objectives. List

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<sup>20</sup> See WLWB Online Registry for [W2012L1-0002 - Nighthawk - ICRP - Version 3.1 - Board Directive and Reasons for Decision - Mar 8, 18.pdf](#)

possible contingencies, and identify the preferred contingency with rationale”.<sup>21</sup> As noted previously by the Board, maintaining this contingency in the interim CRP can be useful. However, given Parties’ objections and Nighthawk’s agreement to remove this contingency, the Board sees no harm in removing it. The more important issue here is that there are no other contingencies in the interim CRP other than this one, as noted by ECCC, who recommended that Nighthawk add additional contingencies (ECCC comment 8). In their response, Nighthawk stated that a passive treatment system is a possible contingency. ENR also noted the lack of contingency options and that there may be different contingencies in different scenarios, for example based on where any water quality exceedances occur (e.g., in site drainage or in Lardass Lake) (ENR comment 13).

The Board agrees that additional contingencies should be identified. This is consistent with ENR’s recommendation that Nighthawk “conduct further options analysis to evaluate if there are feasible alternative contingencies with less associated environmental risk. This should include the findings of any such considerations and rationale for why a contingency option was not carried forward into the ICRP” (ENR comment 14). The Board notes that while passive wetlands may be a reasonable addition to this list, this option is not always suitable for every site, and may require significant time (e.g., years) to research, test, design, and construct.

- ***Decision #17: Nighthawk is to remove the contingency option of placing waste rock on Damoti Lake from Version 3.3 of the interim CRP, develop a list of possible contingencies (in consideration of different scenarios where criteria are not met), identify Nighthawk’s preferred contingency(ies), and provide a rationale for any contingencies rejected by Nighthawk.***

### **3.3 Settling Pond**

The Damoti site has a settling pond where mine water was previously collected prior to being discharged into the environment. ECCC noted that the proposed closure method for the settling pond involves regrading settling pond material, and that the interim CRP does not indicate whether settling pond materials will be tested prior to closure. ECCC recommended Nighthawk test the settling pond for Acid Rock Drainage (ARD) potential and manage the settling pond materials based on the results before regrading (ECCC comment 9). Nighthawk responded that the settling pond materials would be tested for ARD prior to closure, and that materials found to generate ARD would be incorporated into the waste rock pile with similar ARD-potential material. The Board believes that Nighthawk should incorporate this commitment into the interim CRP to ensure that any material at the settling pond with ARD potential is properly managed at closure.

- ***Decision #18: Nighthawk is to incorporate their commitment to test and manage settling pond materials prior to closure into Version 3.3 of the interim CRP.***

### **3.4 Post-closure Monitoring and Maintenance**

#### **3.4.1 Monitoring**

In Version 3.2 of the interim CRP, Nighthawk proposed how project components will be monitored, how monitoring will be reported to the Board, and the frequency of the monitoring. Nighthawk’s proposed monitoring program consists of five years of SNP monitoring and geotechnical inspections.

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<sup>21</sup> See WLWB ([www.wlwb.ca](http://www.wlwb.ca)) ‘Policies and Guidelines’ webpage for [MVLWB Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories \(2013\)](#)

ECCC commented that “monitoring of seepage and runoff from the consolidated waste rock pile may require longer than five years to demonstrate that the discharge is consistently acceptable to enter the receiving environment” and recommended that Nighthawk update the interim CRP to reflect extended monitoring periods (ECCC comment 7). Nighthawk agreed, noting that “this approach is generally consistent with the use of adaptive monitoring frameworks in the NWT”.

This issue is related to the length of time it will take to demonstrate that closure criteria are met, which is discussed in section 3.1.3 of the Reasons for Decision.

- ***Decision #19: Nighthawk is to revise the post-closure monitoring section in Version 3.3 of the interim CRP to reflect the estimated length of time to meet the revised closure criteria.***

### **3.4.2 Maintenance**

Nighthawk did not identify any long-term maintenance activities in interim CRP Version 3.2 and explained that “[t]he remedial options for the Site have been selected in part to eliminate the need for future maintenance.” Nighthawk did not provide any additional detail to support its assumption that there would be no long-term maintenance activities. The Board has previously required DDMI and Dominion to identify long-term maintenance activities and include these costs in the closure cost estimate. Compared to the Diavik and Ekati mines, the remaining structures (e.g., waste rock piles) and associated risks at the Damoti Lake site are small; however, this does not negate the potential for occasional long-term maintenance. For more information on this topic, Nighthawk can consult the Board’s January 25, 2018 guidance<sup>22</sup> to Dominion and its December 17, 2018 Reasons for Decision<sup>23</sup> (page 57-59) to DDMI.

- ***Decision #20: Nighthawk is to provide a detailed explanation for each mine component for why long-term maintenance is unnecessary, in consideration of the Board’s previous correspondence to Dominion and DDMI on this issue.***

### **3.5 Other Revisions**

There were several revisions recommended by Parties and agreed to by Nighthawk that the Board believes should be included in Version 3.3 of the interim CRP to correct errors, provide greater context, and add useful information to the interim CRP.

- ***Decision #21: Nighthawk is to incorporate the following revisions in Version 3.3 of the interim CRP:***
  - a. Revise Table A-4 in Appendix A to indicate when sampling was conducted (ECCC comment 10);***
  - b. Replace “cover” with “overlying material” to differentiate the base material from the material overlying it (ECCC comment 11);***
  - c. Correct section 2.0 to state that the total volume of waste rock and ore brought to the surface during bulk sampling/exploration was 4,051 m<sup>3</sup> (ENR comment 16);***
  - d. Update the proposed monitoring program to include dissolved and total metal fractions for monitoring at SNP 5-5 (ENR comment 22);***

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<sup>22</sup> See WLWB Online Registry for [W2012L2-0001 - Ekati - Security - PDC Refund Request Expectations - Jan 25 18.pdf](#)

<sup>23</sup> See WLWB Online Registry for [Diavik - Closure and Reclamation Plan Version 4.0 - Board Decision Letter and Reasons for Decision - Dec 17 18.pdf](#)

- e. Provide a summary of environmental risks to valued ecosystem components (ENR comment 31);*
- f. Incorporate the information contained in Table 2 regarding water quality monitoring into the main body of the interim CRP (ENR comment 38);*
- g. Add a statement that Nighthawk will seek appropriate regulatory approvals prior to the transfer of any rock or ore from Damoti Lake to Colomac for processing (CIRNAC comment 1);*
- h. Add a statement that Nighthawk will remediate legacy drill holes prior to closure, and provide an estimate of the number of legacy drill holes to be remediated (Board staff comment 3); and*
- i. Correct the reference to the waste rock pile photographs, as per Nighthawk's response to Board staff comment 4.*

The Board has also required several revisions that are less straightforward than those in the previous recommendation. For the most part, this second category of revisions would incorporate information Nighthawk provided in response to Parties' comments and recommendations. Many of Nighthawks' responses provide useful explanations, potential solutions to Parties' concerns, or ideas that Parties may or may not agree with. Parties should have an opportunity to comment on the new information provided by Nighthawk in its responses. Therefore, the Board has not evaluated the responses, and will do so following the public review of Version 3.3 of the interim CRP.

- ***Decision #22: Nighthawk is to address the following comments as part of Version 3.3 of the interim CRP: ECCC comments 3 and 6; ENR comments 8, 20, 21, 23, 28, 32, 33, and 40; and Board staff comments 2, 14, and 16.***

When Nighthawk submits Version 3.3. of the interim CRP, Nighthawk should include a separate revision table in the cover letter or include as part of the revision table required by the Board's *Document Submission Standards*<sup>24</sup> listing the revisions as per Decision #21 and #22. This revision table should indicate how a revision is addressed in the interim CRP or provide rationale for why a revision was not included in Version 3.3 of the interim CRP.

- ***Decision #23: Nighthawk is to identify where the revisions specified by Decision #21 and #22 are addressed in Version 3.3 of the interim CRP.***

### **3.6 Security Deposit**

The Boards have the authority to set financial security amounts for proponents to cover the cost of closure and reclamation. Under Nighthawk's authorizations for the Damoti site, Nighthawk has posted a total security deposit of \$399,729 as per Land Use Permit W2018C0007 and \$110,078 as per Water Licence W2018L2-0003. During the issuance of Nighthawk's Land Use Permit and Water Licence, the Board stated that it recognized the need for Nighthawk to assess and potentially refine its security estimate during the interim CRP review. The Board also noted the central role that CIRNAC and GNWT play in estimating closure costs.<sup>25</sup>

<sup>24</sup> See WLWB ([www.wlwb.ca](http://www.wlwb.ca)) 'Policies and Guidelines' webpage for [MVLWB Document Submission Standards](#).

<sup>25</sup> See WLWB Online Registry for [W2018L2-0003 - Nighthawk - LUP and WL applications - Reasons for Decision - Jan 24 19.pdf](#)

ENR stated that Nighthawk's security estimate should be revised once an updated interim CRP has been approved and should "appropriately capture progressive reclamation activities that have been successfully completed at site". ENR stated that it is willing to work with Nighthawk to develop a security estimate using the RECLAIM model. ENR recommended the RECLAIM estimate be re-evaluated once a new version of the interim CRP has been approved for the site (ENR comment 9). Nighthawk responded agreeing to the security being re-evaluated once a final version of the interim CRP is approved.

The Board wishes to clarify for Nighthawk that once the interim CRP has been approved, Nighthawk should engage with ENR on the closure cost estimate and submit an updated RECLAIM estimate. The Board reiterates that an updated security estimate will be required following approval of the interim CRP.

### **3.7 Engagement**

As per the Board's Closure Guidelines, "effective communication, along with thorough and frequent engagement, needs to occur on various levels when developing CRPs". In Version 3.2 of the interim CRP, Nighthawk has provided a summary of who it engaged, requests resulting from closure engagement in 2015-2016, and an engagement record.

In its comments on Version 3.2. of the interim CRP, the TG noted that Nighthawk's area is a travel route and harvesting area for fishing, trapping, and hunting, and that any future work and exploration in the region will require that historic and future use be profiled. The TG recommended the Engagement Plan ensure families from Wekweètì and other historical users are engaged and indicated that the Department of Culture and Lands would identify how Nighthawk should work with families who need to be informed of Nighthawk's activities (TG comment 1). The TG also noted that closure planning and exploration is being completed at the same time and recommended that Nighthawk communicate about both at the same time as well. The TG noted there are many people who use the area, and there is a need for Nighthawk to communicate annually (TG comment 3). In response to the TG's comments (TG comments 1 and 3), Nighthawk stated that the Engagement Plan would be updated to include interim CRP engagement triggers, and that Nighthawk will continue to reach out regularly.

The TG also noted there is an intent to have an engineering review of closure plans and recommended that the Elders Committee may also review and provide guidance on the final plans, as well as participate in a site visit (TG comment 7). The TG also noted that further Traditional Knowledge (TK) work needs to be done and recommended that TK work be done with the people of Wekweètì with respect to this area, and "their visions of future use and closure plans" (TG comment 8). Nighthawk responded that they look forward to discussing this with the TG during their next semi-annual meeting as described in the Engagement Plan.

As per the Board's Closure Guidelines:

Proponents must outline their approach to engagement and how they have or will integrate local community values into closure and reclamation planning, including any strategies for engaging communities in CRP development and implementation. It is usual for the level of public involvement to increase in relation to the size and duration of the project and the complexity of facility development, traditional significance of the area to residents, and anticipated future use.

Nighthawk responded to several Parties' comments specific to engagement by stating the Engagement Plan would be updated. The Board approved Nighthawk's Engagement Plan during the recent issuance of

their authorizations and directed Nighthawk to submit a revised version which would include information on engagement specific to closure and reclamation.<sup>26</sup> Nighthawk has recently submitted Version 3.2 of the Engagement Plan to the Board.

While Nighthawk has stated its intention to address engagement on the interim CRP in its Engagement Plan, the Board notes that the interim CRP must still place emphasis on “plans for upcoming engagement” as per the Board’s Closure Guidelines. Nighthawk refers to “semi-annual meetings” in their responses to the TG, but it is not clear in the interim CRP when engagement specific to closure and reclamation takes place (i.e., annually, semi-annually, triggered by an event) and what form this engagement occurs in (i.e., meeting, phone call, email).

- ***Decision #24: Nighthawk is to specify the form and frequency of Nighthawk’s engagement specific to closure and reclamation, including plans for upcoming engagement, in Version 3.3 of the interim CRP.***

### **3.8 Other Reviewer Comments**

The Board is of the view that all other issues raised in the public review were adequately addressed by the proponent or can be addressed in future versions of the interim CRP, once some of the more fundamental issues (i.e., closure objectives, waste rock pile closure activity, etc.) are resolved.

**Signed the 28 of June 2019, on behalf of the Wek’èezhìi Land and Water Board**



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Witness



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Joe Mackenzie

Chair, Wek’èezhìi Land and Water Board

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<sup>26</sup> See WLWB Online Registry for [W2018L2-0003 - Nighthawk - LUP and WL applications - Reasons for Decision - Jan 24 19.pdf](#)