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Land and Water Board

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January 31, 2024 File: W2022L2-0001

Kurtis Trefry
Arctic Canadian Diamond Company Ltd.
900-606 4 Street SW
Calgary, AB T2P 1T1

Sent by email

Dear Kurtis,

Re: Ekati – 2022 3-Year Waste Rock Storage Area Seepage Survey Report – Lac de Gras, NT

The Wek'èezhìı Land and Water Board met on January 24, 2024 and considered the 2022 3-Year Waste Rock Storage Area Seepage Survey Report (the Seepage Report), submitted by Arctic Canadian Diamond Mine Ltd (Arctic) on August 11, 2023 as required by Water Licence (Licence) W2022L2-0001.

The Board has determined that the Seepage Report meets the requirements of Part H, Condition 9 and Schedule 6, Condition 3 of the Licence and hereby approves the Report as submitted. The details of the Board's decision are set out in the attached Reasons for Decision.

The next 3-Year Seepage Report is to include the revisions outlined in the attached Reasons for Decision and should be prepared in accordance with the Land and Water Board's *Document Submission Standards*[1]. The attached Reasons for Decision also includes direction regarding the next submission of the Waste Rock and Ore Storage Management Plan (WROMP).

As discussed in the attached Reasons for Decision, concerns regarding seep screening criteria and seepage management responses are expected to be captured by the development of the Seepage Response Framework (SRF) required by Part H, Condition 7 of the Licence. The Board expects that Arctic will consider all the feedback regarding seep screening criteria and seepage management responses received during this public review in the development of the SRF. The Board would also like to remind Arctic that until there is a Board-approved WROMP that addresses management of seeps that exceed EQCs at the point the seep daylights from the WRSA, Arctic is required to notify the GNWT Inspector and the Board if a seep

[1] See WLWB Policies and Guidelines webpage for MVLWB *Document Submission Standards*.

exceeds an EQC at point of daylighting from the WRSA, and to seek the GNWT Inspector's direction on how to manage the seep.

Please direct questions or concerns regarding this letter to Ryan Fequet in writing.

Yours sincerely,

Mason Mantla
Chair, Wek'èezhìı Land and Water Board

Bcc'd to: Ekati Distribution List
Attached: Reasons for Decision

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Reasons for Decision

Reference/File Number:	W2020L2-0004 (Type "A" Water Licence)
Licensee:	Arctic Canadian Diamond Company Ltd. (Arctic)
Subject:	2022 3-Year Waste Rock Storage Area Seepage Survey Report

Decision from the Wek'èezhìı Land and Water Board
Meeting of January 24, 2024

1.0 Decision

On January 24, 2024, the Wek'èezhìı Land and Water Board (WLWB or the Board) considered Arctic Canadian Diamond Company Ltd.'s (Arctic's) 2022 3-Year Waste Rock Storage Area Seepage Survey Report.[1] In consideration of the submission, previous Board direction, reviewer comments and proponent responses, the Board has made the following decisions:

1. To approve the 2022 3-year WRSA Seepage Survey Report;
2. Require future versions of the 3-year WRSA Seepage Survey Reports to include Report Requirements #1 to 4; and
3. Require Version 13.0 of the WROMP to include WROMP Revisions #1 to 4.

2.0 Background

The Licence requires an annual seepage survey be conducted of all constructed ore stockpiles and Waste Rock Storage Areas in accordance with the Waste Rock and Ore Storage Management Plan (WROMP). This annual report is required to include an overview analysis of major trends, site plans indicating location of seepage, and summary of recommendations for future seepage monitoring or management actions. Every

[1] See WLWB Online Registry (www.wlwb.ca) See WLWB Online Registry (www.wlwb.ca) for Ekati – 2022 3-Year WRSA Seepage Survey Report Part 1 of 4, for Ekati – 2022 3-Year WRSA Seepage Survey Report Part 2 of 4 for Ekati – 2022 3-Year WRSA Seepage Survey Report Part 3 of 4 and for Ekati – 2022 3-Year WRSA Seepage Survey Report Part 4 of 4

three years, an interpretive seepage survey report is required to be submitted (as per Part H, Condition 9 and Schedule 6, Condition 3 of Licence W2220L2-001)[2] to the Board for approval.

The 2022 3-year WRSA Seepage Survey Report (the Report) was submitted by Arctic on June 27, 2023. After a conformity evaluation by Board staff, an updated Report was provided on August 11, 2023.

Board staff distributed the Report for public review on October 24, 2023, inviting reviewers to provide comments and recommendations using the Online Review System by November 14, 2023. On October 13, 2023, the comment deadline was extended to December 12, 2023, following an extension request from a party received prior to the deadline. Comments and recommendations were received by the revised deadline of December 12, 2023 from the Independent Environmental Monitoring Agency (IEMA), Government of the Northwest Territories – Environment and Climate Change (GNWT-ECC), and the Tłı̨chǫ Government (TG); Board staff also submitted questions. Reponses from Arctic were due on December 19, 2023; but the deadline was revised to December 22, 2023 following an extension request by Arctic. Responses to reviewer comments and recommendations were received by the revised deadline of December 22, 2023. The review summary is available on the Online Review System.[3]

3.0 Reasons for Decision

The Report contained conformity tables that describe how the Licence conditions and previous Board directions were addressed within the submission. The Board has reviewed these tables and has also reviewed the comments and proponent responses submitted during the public review. Based on these submissions, the Board has decided to approve the Report, with additional direction for the next version.

- ***Decision #1: The Board has approved the 2022 3-Year Waste Rock Storage Area Seepage Survey Report***

As discussed in section 3.1 of this Reasons for Decision (RFD), the method of identifying and evaluating seeps, as well as responding to problematic seeps, is linked to the Seepage Response Framework (SRF) included in the Waste Rock and Ore Storage Management Plan (WROMP). The SRF was a large topic of discussion during the recent Water Licence Renewal proceeding and Part H, Condition 7 of Water Licence W2022L2-0001 requires submission of the SRF within 90 days of issuance of the Licence. The renewed Licence came into effect on December 18, 2023;[4] thus, the SRF is to be submitted within the next two months. It is expected that the updated SRF will help address many of the issues discussed in section 3.1

Section 3.2 discusses comments linked to areas of improvement for future 3-Year Seepage Reports and outlines requirements for future submissions. Section 3.3 discusses comments and recommendations that are to be addressed in the next version of the WROMP.

[2] Note that the 3-Year Seepage Report was submitted under Part H, Condition 4 of W2020L2-0004, which has since been replaced by the renewed Water Licence W2022L2-0001.
[3] See WLWB Online Review System (new.onlinereviewsystem.ca) for Ekati - 2022 Three-Year WRSA Seepage Report
[4] See WLWB Online Registry for Ekati - Renewal - Water Licence - Issuance Letter and Licence - Dec 1_23.pdf

3.1 Seepage Response Framework

There is currently no approved Seepage Response Framework (SRF). In Version 11 of the WROMP, Arctic proposed a SRF, but it was not approved by the Board because the proposed seepage thresholds were greater than the Licence Effluent Quality Criteria (EQCs). In its Reasons for Decision for Version 11 of the WROMP, the Board noted the Framework appeared premature, and in the submitted form, did not comply with the Licence.[5] The Board subsequently decided: a) to require Arctic to propose seepage management that is consistent with the requirements of Water Licence W2020L2-0004 in WROMP Version 11.1; and b) until there is a Board-approved WROMP that addresses management of seeps that exceed EQCs at the point the seep daylights from the Waste Rock Storage Area (WRSA), Arctic is required to notify the GNWT Inspector and the Board if a seep exceeds an EQC at point of daylighting from the WRSA, and to seek the GNWT Inspector's direction on how to manage the seep.[6]

WROMP Version 11.1 did not include a SRF, and instead proposed ongoing seepage management consistent with the WROMP V.11 Reasons for Decision. WROMP V.11.1 was approved, with the Board noting that the 2022 Water Licence Renewal was forthcoming and that any changes to EQCs and/or response strategies could be proposed at that time.[7]

As part of the Licence Renewal, Arctic included a proposed conceptual WRSA SRF in its November 2, 2022 Application, noting during the proceeding that the current practice does not appear satisfactory to reviewers and the Board, and the use of the proposed SRF would be a more appropriate risk-based approach.[8] During the proceeding, no parties had any issue in principle with the use of the SRF; however, there was much discussion during the proceeding regarding the application of the SRF, including how it would work in practice and in conjunction with existing Licence requirements, and the information that should be included in the SRF. The Board subsequently decided to require Arctic to submit a WRSA Seepage Response Framework for approval within 90 days of the issuance of Licence W2022L2-0001, as required by Part H, Condition 7 of that Licence.[9]

3.1.1 Seep Screening Criteria

Currently, Arctic's method to determine a seep of potential concern (SoPC) is related to the seep water quality and if the quality exceeds a set concentration (e.g., EQC or 95th percentile of the historical value). If the seep has water quality below these limits, it is not considered a SoPC and no management of the seep is required beyond the location where the seep daylights from the WRSA. If a seep has water quality above these limits, it is flagged as a SoPC and Arctic is to initiate response actions as described in the WROMP.

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[5] See WLWB Online Registry for Ekati – WROMP – 2019 Seepage Survey Report and WROMP V11 – Reasons for Decision – Mar 15_22.pdf
[6] Ibid
[7] See WLWB Online Registry for Ekati – WROMP V11.1 – Reasons for Decision – Nov30_22.pdf
[8] See WLWB Online Registry for Ekati - Renewal - Summary of Proposed Changes - Nov 2_22.pdf
[9] See WLWB Online Registry for Ekati - Licence - Renewal - Recommendation to Minister and Reasons for Decision - Oct 17_23.pdf

Several comments regarding the criteria to determine if a seep is a SoPC were received and are discussed in the paragraphs below. Comments regarding the management and response actions applied to SoPCs are discussed in section 3.1.2 of this RFD.

With respect to identifying SoPCs, IEMA (comment 8) commented that Arctic's approach to identifying SoPCs is problematic because it relies on comparing "the current year's seepage monitoring results to the 95th percentile of the previous data, including all data up to the immediately preceding year." IEMA explained that this "approach creates a shifting baseline for comparison of seepage water quality" and that "such a baseline would likely not be effective for identifying problematic conditions where there are gradual shifts in water quality". IEMA suggested that comparisons of SoPCs with pre-mining data or reference conditions would be more appropriate because this would more effectively identify if a seep is leading to changing conditions. Further, IEMA noted that the reliance on comparisons to EQC as a means of identifying SoPCs does not provide for proactive management of seepage conditions in order to avoid non-compliance with the Licence. Arctic responded that the screening of SoPCs was developed to both identify when seepage water quality contains constituents that are exceeding conservatively developed EQCs, as well as to examine constituents that may be increasing though time (i.e., exceeding the 95th percentile of this historical database). Arctic also noted the development of the revised SRF as required by the Licence in its response. The Board notes that the need for earlier detection and management of potentially problematic seeps was discussed through the Water Licence Renewal proceeding and it is expected that the incoming SRF will address this issue.

GNWT-ECC also commented on the criteria used to identify SoPCs, including the use of the 95th percentile of historical data. GNWT-ECC (comment 10) recommended that Arctic consider redevelopment of the Seepage Screening Criteria through the WROMP, including providing:

> …additional rationale to clarify how parameter concentrations higher than the 95th percentile of the historical operational monitoring dataset can be used as effective seepage screening criteria to prevent EQC exceedances at the point of entry to the Receiving Environment…and the redevelopment of the screening criteria in the WROMP for seeps at the toe of the WRSA and at the point of entry to the Receiving Environment, noting that application of EQC values for seeps at the point of entry is not a screening tool as this identifies non-compliance under the Water Licence.

GNWT-ECC's recommendation was supported by observations that the 95th percentile values are based on mine-impacted data and that the 95th percentile value can be higher than the Maximum Concentration of any Grab (EQC). GNWT-ECC provided examples of specific seep locations where this was observed. Arctic responded that the exceedances referenced by GNWT-ECC were limited to Seep-080 (i.e., at the Lynx crusher pad) and those in Panda/Koala NE/NW area which enter the LLCF rather than the receiving environment and are therefore not considered SoPCs. Arctic also pointed to the development of the new SRF as a means to develop proactive indicators. IEMA (comment 7) recommended that the Seepage Report should identify seeps with exceedances as SoPCs even if they would flow to mine-affected areas

(e.g., LLCF). IEMA further noted that the Seepage Report should then identify responses and mitigations that are appropriate for planning and implementing the closure plan. Arctic committed to providing action level triggers for seepage management along with the required SRF, and to ensure discussion around SoPCs be provided in the development of the SRF.

GNWT-ECC (comment 11) further recommended updates to the seepage screening criteria through the WROMP. Specifically, GNWT-ECC recommended that "seeps exceeding the Maximum Concentration for Any Grab Sample outlined in the Licence should be identified as being out of compliance under Condition 15 of the Licence and discussed in the Report." GNWT-ECC also recommended that discussion of such an exceedance should include "adaptive management actions to be taken and reporting actions the Inspector and/or Board to address seeps of potential concerns and any exceedances of EQC". Arctic responded that it is "actively developing the seepage response framework as committed to during the permitting of the Point Lake Project and as required by Water Licence W2022L2-001" and that "the Seepage Response Framework is being developed specifically to provide a structure that describe condition that require additional and a systematic approach to monitoring and managing the potential effects of seepage in Receiving waters and the terrestrial environment."

The Board is of the view that the concerns regarding seep screening criteria, and subsequent commitments made by Arctic during the 2022 3-year Seepage Report review will be captured by the development of the SRF including benchmarks and action levels as required by Schedule 6, Condition 2(v) of the renewed Licence).

The Board expects that Arctic will consider all the feedback regarding seep screening criteria received during this public review in the development of the SRF.

3.1.2 Adaptive Management Triggers and Responses

This section discusses comments that were received during the public review about the management of SoPCs and response actions to seeps exceeding effluent quality criteria (EQC).

As a general comment, Tłı̨chǫ Government (TG comment 1) noted "that there are several exceedances of effluent quality criteria (EQC)" and that "Arctic has reported EQC exceedances in seepage in the past, and these were discussed during the recent Water Licence renewal proceeding." Tłı̨chǫ Government further stated that "It is not clear whether mitigations are required to protect water and fish." Tłı̨chǫ Government acknowledged the upcoming SRF and noted that mitigations would be identified through that process, so it did not provide a specific recommendation at this time. Arctic acknowledged the comment and responded that the "proposed seepage response framework will include terrestrial and aquatic benchmarks as appropriate for each seep location as well as defined risk-based adaptive management actions/mitigations."

IEMA (comment 6) recommended that Arctic revise its approach to management of SoPCs so that any seep categorized as a SoPC will be managed as one until there are sufficient data to demonstrate that the seep does not pose a risk to the environment, and that subsequent 3-Year Seepage Reports should discuss

all SoPCs identified within the 3-year period, not just those identified in the final year. Arctic responded that the report "identifies if a seep that was identified as an SOPC in the year of reporting as well as whether that seep also identified in previous years (five years prior) and what constituents drove that identification." Arctic further noted the 3-year Report allows longer term trends to be identified so that seeps exhibiting symptoms of longer-term exceedances in water quality are managed appropriately. Arctic also noted the upcoming submission of a revised SRF, as required by Licence W2022L2-001.

Other comments received on this topic during the public review were focussed on specific exceedances and associated responses:

- Tłı̨chǫ Government (comment 4) and IEMA (comment 2) commented on response actions related to Total Suspended Solids (TSS) EQC exceedances at the Fox WRSA. IEMA recommended that Arctic clarify why the response action for exceedance of the TSS EQC at Seep-362A was different than the response action at Seep-377 (two different seeps exceeding TSS EQC near the Fox WRSA). Tłı̨chǫ Government noted that some, but not all, of the seeps with TSS EQC exceedances will have silt curtains installed. IEMA recommended that Arctic identify erosion control measures to address the ongoing TSS exceedances at Fox WRSA or provide rationale for why erosion control measures are not possible. Similarly, Tłı̨chǫ Government recommended that Arctic clarify why silt curtains aren't planned for all Fox WRSA seeps with TSS exceedances. Arctic responded that "during Freshet 2024, seeps surrounding Fox WRSA will be closely screened against the appropriate EQC…[and]…Any discrepancies will be addressed actively in accordance with the upcoming Seepage Response Framework recommendations" Arctic referred to past examples of adaptive management responses (such as silt curtain installation, localized toe berm construction, increased monitoring of select seepage flow and chemistry, and re-location of upslope rock material) as techniques that could be used in the future. The Board notes that while the timing of an approved SRF is unknown, it will most likely not be before Freshet 2024; thus, relying on the upcoming SRF to manage seeps around Fox WRSA this coming season may not be possible.

- IEMA (comment 2) commented on the response action related to seeps in the Misery area, specifically questioning why the response action for total aluminum, total copper, and total iron EQCs at Seeps 081 and 081A (i.e., notify the GNWT Inspector and seek direction on how to manage the seep) was different than the response action at Seep-080 (i.e., continue regular seepage monitoring). IEMA also recommended that Arctic clarify what circumstances trigger a mitigative management response aimed at reducing environmental loading (i.e., silt curtain installation, localized toe berm construction, re-location of upslope rock material) as compared to a non-mitigative response (i.e., increasing monitoring of select seepage flow and chemistry). Arctic responded that the seepage exceedances observed in the Misery area (i.e., SEEP-080) were coincident with the construction of the Lynx Crusher Pad in 2016, and that this area continues to be actively monitored, but it expected that exceedances will cease over time and not continue post-closure. Arctic noted that it works with the Inspector to determine appropriate adaptive management responses to identified seeps of potential concern and in the instance an exceedance of EQC should occur. Arctic noted that it would include the

comment/recommendation for resolution in the upcoming SRF, as required by Licence W2022L2-001.

- GNWT-ECC (comment 13) recommended that the 3-Year Seepage report include a discussion of proposed Response Actions and next steps following the assessment and identification of SoPCs. It also recommended that Planned Response Actions and active Response Actions listed in the Executive Summary for SEEP-362A, SEEP-377 and SEEP-081/081A be discussed in the Report to clarify what actions have been implemented and what actions are still proposed. GNWT-ECC suggested that approval from the Inspector or the Board should also be included as part of response actions. Arctic responded that it will "provide action level triggers for seepage management along with the required Seepage Response Framework… [and]…will ensure discussion about the concerned seeps be provided in future reports. As required in the new Licence W2022L2-0001, clear direction on Reporting on the implementation of the Framework will be developed."

- Board staff (comment 1) asked Arctic to clarify if Inspectors had provided any feedback regarding these exceedances, and if so, to identify the recommendations and how they were actioned. Board staff (comment 2) also asked Arctic to confirm if there had been any EQC exceedances that had been reported to the Inspector, but not the Board. Arctic responded that no feedback from the Inspector was available for incorporation into the 2022 Seepage Report, and that no exceedance notifications were reported to the Inspector but not the Board. Board staff were not able to locate any notifications that were provided to the Board. Based on the results provided in the 2022 3-Year Seepage Report, it is not clear why this would have been the case given that EQC exceedances were detected and given the Board's previous direction.

Based on the comments and recommendations discussed above, it is clear to the Board that there are concerns with respect to the current seepage response framework. As discussed, this was also evident during the Licence renewal proceeding. Given the impending submission of the SRF, the Board is of the opinion that the concerns regarding the adaptive management and mitigation measures that were brought forward during the 2022 3-year Seepage Report review are best addressed through the review of the upcoming SRF. In response to comments on this topic and as discussed above, Arctic committed to providing procedures/timelines for seepage management, and directions on the implementation in the SRF. The Board is of the view that this will in part be captured by the description of actions that may be taken if an Action Level is exceeded as required by Schedule 6, Condition 2(v)(iv)(c) of the renewed Licence.

***The Board expects that Arctic will consider all the feedback regarding seepage management responses received during this public review in the development of the SRF*.**

The Board acknowledges that the approval of the SRF may take time, and that ongoing seepage management is required in the interim. Improvements to the identification, reporting, and responses to seeps of potential concern may be required prior to the approval of the SRF. The Board has been clear in

its expectations that Arctic notify the Board and Inspector and seek Inspector direction when EQCs are exceeded, however it is not clear that this has always taken place.

The Board reminds Arctic that until there is a Board-approved WROMP that addresses management of seeps that exceed EQCs at the point the seep daylights from the WRSA, Arctic is required to notify the GNWT Inspector and the Board if a seep exceeds an EQC at point of daylighting from the WRSA, and to seek the GNWT Inspector's direction on how to manage the seep.

3.2 Future 3-Year Seepage Reports

This section discusses comments and recommendations received during the public review that highlight items that could have been better addressed and/or presented. Some of these were addressed by Arctic's responses, some of which involved commitments by Arctic to include additional information and/or improvements in future reports. As these items do not influence the main conclusions of the Report, the Board is not requiring revisions to the 2022 Report to address these comments/recommendations; however, the Board is of the view that these comments indicate that there is opportunity for future reports to be improved and more thorough. Thus, where appropriate, the Board has outlined specific requirements for future reports.

- ***Decision #2: Arctic is to include Report Requirements #1 to 4 in future versions of the 3-year Seepage Report***

3.2.1 – Data Presentation

Data Display Methods

IEMA (comment 3) recommended that future Seepage Reports incorporate both the descriptions of planned SoPC adaptive management actions (Table 1) and hypothesized drivers (Table 5.2-1) into single pit-specific summary tables, as it would make comparison and interpretation of results much easier. Arctic agreed to revise future reports to include this presentation of data. The Board has captured this commitment in Report Requirement #1.

GNWT-ECC (comment 7) commented that "the data presented in the scatter plots are difficult to interpret" and that "presentation of key acid-base accounting (ABA) parameters (i.e., neutralizing potential (NP) and potential acid generation (AP)) and trace elements as time series graphs may improve tracking of potential geochemical changes and trends for waste rock." In its comment, GNWT-ECC indicated that a table summarizing the number of PAG samples in recent years, in comparison to earlier verification monitoring, may be useful in interpreting the proportion of PAG material displaced over time as development progresses but did not make a formal recommendation with respect to requiring such a table. Arctic responded that it "acknowledges and appreciates the suggestion for future data representations of the static geochemical analysis and will continue to examine effective ways to present this data in future iterations of the report". Arctic added that "time series is not necessarily appropriate for the static geochemical data (but is considered appropriate for seepage)". At this time, the Board does not require any particular revision with respect to this comment.

Sampling Locations

GNWT-ECC (comment 3) noted discrepancies between the sampling locations displayed on the site plans (i.e., Figures 2.2-1 and 2.26) and those presented in the corresponding data table (Table 2.2-1). GNWT-ECC recommended that the table be updated to include all the seeps that were sampled, and that the figures be updated to include all sampling locations, including the reference stations that are being considered for discontinuation. Arctic acknowledged the errors in its response, but did not commit to including the reference stations, noting that "for reasons stated in the three-year seepage report, continued sampling of the reference locations does not appear to fulfill the original aim of their establishment and thus suggested their discontinuement. However, Burgundy continues to sample flowing seeps at the reference locations and will continue to do so unless formal allowance is provided for their discontinument." The Board is of the opinion that all active sampling locations should be presented in the 3-year Seepage Report and requires Arctic to include the locations of all sampling locations in the relevant tables and figures, until such a time as the stations have been approved for discontinuance. This requirement has been captured in Report Requirement #2.

GNWT-ECC (comment 6) noted that Figure A.1 does not appear to show all 13 of the waste rock samples collected from the Pigeon Pit and recommended that all waste rock samples collected from Pigeon Pit be included in the figure. Arctic responded that it would ensure future iterations of the report contains all sampled waste rock locations on the provided maps. The Board has captured this commitment in Report Requirement #1.

Graph Legibility

IEMA (comment 13) commented that the graphs presented in the 3-year Seepage Report are difficult to read and interpret and recommended that Arctic should more clearly differentiate the plotted data lines and trends. Arctic committed to revisions in future iterations of the 3-year Seepage Report. The Board has captured this commitment in Report Requirement #1.

GNWT-ECC (comment 5) noted that "time series graphs showing REF-005 and REF-040 were included in the Report; however, the symbols/trend lines were difficult to differentiate from other seeps that had nearly identical colours and the data were not discussed in the body of the Report, and that Data for REF-037 was not shown on the Sable WRSA seep plots." While GNWT-ECC did not make a formal recommendation with respect to the figures, Arctic responded that "Continued refinement to effective visualizations of data will continue to be examined in next iterations of the report". The Board has captured this commitment in Report Requirement #1.

- ***Report Requirement #1: Future 3-Year Seepage Reports are to incorporate commitments provided in response to the following comments: IEMA comments 3 and 13; and GNWT-ECC comments 5 and 6.***

- ***Report Requirement #2: Future 3-Year Seepage reports are to include the locations of all seepage sampling, as recommended by GNWT-ECC comment 3.***

3.2.2 Trend Analyses

EQC exceedances

Tłı̨chǫ Government (comment 2) commented that Seepage from the Lynx Crusher Pad (LCP) exceeded some EQCs, but that it is unclear whether the source of these higher concentrations is the waste rock used to construct the pad or the result of the activities on the pad. Tłı̨chǫ Government recommended that Arctic discuss whether it anticipates the three seeps at the Lynx Crusher pad may continue to be elevated post-closure, and if so, what the potential pro-active mitigations are. Arctic responded that the exceedances observed in the seepage in the Misery area (i.e. SEEP-080) were coincident with the construction of the LCP in 2016, and that it is anticipated that exceedances will cease over time and not continue post-closure. Arctic responded that the area continues to be actively monitored, and that the SRF will address mitigation measures, including pro-active adaptive management actions. The Board acknowledges the ongoing monitoring and the development of the SRF and is of the opinion that Arctic has adequately addressed the comment, and that no adjustments to the 3-Year Seepage Report are necessary with regards to this item at this time.

Tłı̨chǫ Government (comment 3) noted EQC exceedances in the Panda/Koala SW seepage, but that they are not considered SoPCs by Arctic because they go into the Long Lake Containment Facility (LLCF) and not into the receiving environment. Tłı̨chǫ Government stated that it presumes that the LLCF will be considered the receiving environment upon closure and recommended that Arctic comment on "whether the seeps that had EQC exceedances in the Panda/Koala SW area are expected to improve by the time the mine closes". If not, Tłı̨chǫ Government asked Arctic to comment on whether seepage from this area is expected to meet closure objective WR-1 (i.e., "Seepage water quality from WRSAs is safe for people, terrestrial, and aquatic ecosystems"), and if not, to identify possible mitigations. Arctic responded that it anticipates that the Panda/Koala Seepage will improve in terms of quality under a closure scenario as exceedances for this area were tied to both oxidative dissolution as well as erosional/weathering, both of which can be expected to diminish under closure. The Board is of the opinion that Arctic has adequately addressed the comment, and that no adjustments to the 3-Year Seepage Report are necessary with regards to this item at this time.

Concentration Variability

IEMA (comment 12) noted that sulphate concentrations across all monitored Fox seeps were found to have higher variability through time along with a general increasing trend. IEMA recommended that Arctic provide an explanation of the observed increasing sulphate trend across all monitored Fox seeps and its possible implications on long-term seepage quality (since the purpose of the 3-Year Seepage Report is to provide an interpretation of the results of all survey data collected since the inception of the Project) and a consideration of how the results may affect the WROMP. Arctic responded that "it is likely the kimberlite with some contribution from the diabase (both of which contain ~0.3 % and ~0.25% average sulfur) compared to ~0.04% average sulfur) where sulfide oxidation is occurring (albeit at relatively low rates) within the pile." Arctic also stated that "future reports will include this interpretation of the results, however, notably the sulphate concentrations remain below the hardness dependent EQC and continue to in the 2023 seepage data." The Board has captured this commitment in Report Requirement #3.

GNWT-ECC (comment 7) noted that some of the 2022 Coarse Kimberlite Rejects (CKR), Misery Underground (MUG) granite, and Pigeon (schist and diabase) samples were outside the distribution of respective historical datasets for copper (Cu), chromium (Cr), and lead (Pb). GNWT-ECC recommended Arctic provide rationale regarding the possibility of increasing concentrations for Cu, Cr, and Pb given the higher maximum and median values for Cu in the CKR samples, as well as Cr and Pb for the Pigeon Pit indicating new maxima. Arctic responded that some variabilities can be expected from year to year and acknowledged there were indeed some new maximum concentrations recorded in 2022. Artic further states that it did not anticipate a material change to seepage chemistry as infiltrating water interacts with this new material, and that seepage monitoring would continue to confirm that expectation. The Board is of the opinion that Arctic has adequately addressed the comment, and that no adjustments to the 3-Year Seepage Report are necessary with regards to this item at this time.

Effects of Low Precipitation

IEMA (comment 11) recommended that Arctic comment on what impact, if any, the low levels of precipitation that occurred in 2022 at Ekati would have had on seepage volumes and chemistry. Arctic responded that lower precipitation years did not appear to have a major effect on the chemistries of flowing seeps in the same year, and committed to examining the effects that drier years may have effects on seepage chemistries in future reports. The Board has captured this commitment in Report Requirement #3.

Geochemical Characterization

IEMA (comment 4) recommended that Arctic clarify its statement in Section 1.1.4.3 about negligible contributions of contaminants to seepage from metasediment/schist. Arctic clarified that when diabase and metasediment are present in minor volumes in a WRSA, their relative contributions to seepage chemistry compared to more voluminous waste rock would be less. Arctic committed to clarifying the wording in future versions of the Report. The Board has captured this commitment in Report Requirement #3.

Linkages to the Aquatic Effects Monitoring Program (AEMP)

Tłı̨chǫ Government (comment 5) recommended that the seepage survey summarize any important AEMP results related to EQC exceedances in seepage. For example, Tłı̨chǫ Government suggested that Arctic could discuss whether there have been any AEMP Action Level exceedances and Response Plans that could be related to the EQC exceedances. Arctic responded that “the AEMP Annual Report considers both the [Aquatic Response Framework (ARF)] and Seepage Monitoring when describing potential effects on the receiving environment and is the most appropriate location for this integrative discussion of potential effects on the Receiving Environment”. While the Board acknowledges that considering seepage monitoring results as part of the interpretation of the AEMP results is appropriate and arguably expected, in cases where seep water quality exceeds a SRF trigger (i.e., benchmark and/or Action Level), there may also be value in summarizing and/or discussing findings from the AEMP to help understand implications,

if any, of the exceedance. Thus, the Board requires consideration, where appropriate, of AEMP results near locations where water quality of seeps exceed SRF triggers (see Report Requirement #4).

- ***Report Requirement #3: Future 3-Year Seepage Reports are to incorporate commitments provided in response to the following comments: IEMA comments 4, 11, and 12.***

- ***Report Requirement #4: Future 3-Year Seepage Reports are to consider, where appropriate, AEMP results near locations where water quality of seeps exceed triggers.***

3.3 Updates to WROMP V.12.0

This section of the RFD discusses comments and recommendations received during the public review that are related to the WROMP. WROMP Version 12 has recently undergone public and is the subject of another Board Decision. While there was some overlap in the topics/issues raised in both public reviews, some topics were only raised here. In such cases, and where appropriate, the Board has outlined revisions that are to be included in Version 13.0 of the WROMP. Details on the timing of the submission of Version 13.0 of the WROMP are discussed in the WROMP V.12.0 RFD.[10]

- ***Decision #3: Version 13.0 of the WROMP is to include WROMP Revisions #1 to 4.***

3.3.1 References to Receiving Environment

GNWT-ECC (comment 12) commented that the 3-Year Seepage Report and WROMP should both clarify what constitutes a destination Receiving Environment, as several waterbodies are shown as potential destinations in the WROMP V.11.1 figures but are not listed in the corresponding section of the WROMP. GNWT-ECC recommended that revisions be made to ensure all listed downstream environments presented within Section 7.9.2 of the WROMP conform with the relevant figures, and that all data for receiving environments downstream of a WRSA should be included in the seepage reports. Arctic responded that the GNWT's consideration of including all downstream Receiving Environments was included as part of the WROMP V.12.0 development.

The Board notes that section 5 of WROMP V.12.0 states that “Receiving Environments in the WROMP follow the definition of “Receiving Environment” in the Water Licence (W2020L2-004), which is: “Receiving Environment” means, for the purpose of this License, the natural aquatic environment that receives any deposit or Discharge of Waste, including Seepage or Minewater, from the Project.” As discussed in the Reasons for Decision for WROMP V.12.0, several comments were received during review of WROMP V.12.0 with respect to the definition and use of the term Receiving Environment, and Arctic committed to updating future versions of the WROMP to include the updated definitions as per renewal Licence W2022L2-001, and to address the recommendations made during the review of WROMP V.12.0 and any received during the upcoming SRF Review.

[10] See WLWB Online Registry for Ekati – WROMP – Version 12.0 – Reasons for Decision – Jan 31_24

Related to the definition of Receiving Environment, IEMA (comment 1) recommended that Arctic acknowledge that seeps enter the Receiving Environment at the point where they daylight at the toe of the WRSA, rather than using the current wording, which implies that the Receiving Environment begins downstream of the location where the seep first daylights at the toe of the WRSA or slope. Arctic acknowledged the comment and confirmed that EQC criteria is applied at the toe of the WRSA. It is noted that the current application of EQC at the point where seepage daylight has already been communicated by the Board, and as committed by Arctic in response to GNWT-ECC comment 12, the next version of the WROMP will reflect the updated definition for Receiving Environment.

The Board notes that the Reasons for Decision for WROMP Version 12.0 includes a requirement for Version 13.0 of the WROMP to reflect the updated definition for Receiving Environment and the definition for Receiving Water; thus, the Board has not repeated the direction here.

3.3.2 Discontinuance of Monitoring at Select Reference Seeps

IEMA (comment 9) noted that Arctic wished to discontinue monitoring at three reference seepage sites and instead rely on results from baseline monitoring and the current report, and that the results from reference sites are not considered in the interpretation of seepage conditions. IEMA recommended that Arctic continue monitoring reference areas, and that if Arctic wishes to discontinue monitoring, it should make a specific request to do so, and provide supporting data, analysis, and rationale. Arctic responded that it continues to sample flowing seeps at the reference locations, but that for reasons stated in the three-year seepage report, continued sampling of the reference locations does not appear to fulfill the original aim of their establishment and thus suggested their discontinuation.

GWNT-ECC (comment 5) commented that Arctic did not provide a rationale supported by data to evaluate the request to modify the monitoring program and discontinue monitoring the reference stations. The proposed change to the monitoring program should be supported by site maps showing the location and flow direction of the reference seeps and relevant flow rates and water quality data (e.g., tabulated statistical distributions and/or time series graphs compared to baseline data, relevant EQCs, and/or impacted seepage). GNWT-ECC recommended that Arctic provide rationale supported by data to evaluate the request to modify the monitoring program and discontinue monitoring the reference stations, including site maps showing the location and flow direction of the reference seeps and relevant flow rates and water quality data. Arctic responded that it continues to sample flowing seeps at the reference locations, but that for reasons stated in the three-year seepage report, continued sampling of the reference locations does not appear to fulfill the original aim of their establishment and thus suggested their discontinuation.

The Bord confirms that changes to the monitoring program are to be specifically requested and supported by information as indicated by IEMA and GNWT-ECC. As the WROMP outlines the seepage survey program, changes to the sampling program should be requested via the WROMP. The Board notes that the proposed discontinuation of the reference seeps was discussed during the review of WROMP V.12.0 and that Arctic made the following commitment: “Burgundy continues to sample flowing seeps at the

reference locations and any requested change to this protocol would be accompanied by more formal requests and justifications prior to any change in sampling." As noted in the WROMP V.12.0 Reasons for Decision, comments and recommendations provided on this topic outline the information that parties have indicated they would like to see when considering such a request. The Board is of the opinion that it would be valuable for Arctic to consider this information in any future proposal to discontinue sampling.

3.3.3 Pigeon Pit

Seepage Monitoring

IEMA (comment 10) commented that the flow path at Pigeon WRSA indicates that most water in this area flows internally, eventually ending up in sumps or the open pit, but that no sample results are provided for this water (i.e., the water in the sumps or the open pit). The only monitoring takes place at Seeps 389 and 396, which are both located on the east side of the pile in close proximity to each other. IEMA recommended that Arctic sample, analyze, and interpret water quality at additional locations around the Pigeon WRSA, including where seepage is collected into the mine-water system. Arctic responded that the seepage monitoring followed established protocols at the Pigeon WRSA while it was still under development. Since the Pigeon Open Pit development was completed in 2022, Arctic explained that geotechnical monitoring of the pit walls is no longer taking place and that access to the open pit is prohibited. In its response, Arctic also indicated that it submitted the Pigeon Open Pit Flooding Plan in 2023to facilitate pit flooding as soon as feasibly possible. Arctic further indicated that a one-time sample of in pit sumps would not be representative of conditions and provide no useful information regarding seepage monitoring at the Pigeon WRSA, and that because the area is closed, access is prohibited, for safety.

Based on Arctic's response, the Board acknowledges that it is not possible to currently sample water in the sumps of Pigeon Pit. It is unclear from IEMA's comment if the concern is about opportunities to characterize water quality in the pit to help inform closure or if IEMA believes other areas around the WRSA require monitoring to reflect seepage quality that may be flowing to the Receiving Environment, away from the pit. If the former, the Board is of the view that monitoring required to inform closure (i.e., to demonstrate thar closure criteria are being met prior to reconnection) will help address this. If the latter, more information would be needed prior to the Board requiring any additional seepage monitoring. To address this, the Board require that Arctic engage with IEMA prior to submission of V.13.0 of the WROMP to discuss this comment. Should discussions with IEMA suggest that additional seepage monitoring locations are needed, Arctic should propose these in Version 13.0 of the WROMP.

- ***WROMP Revision #1: Arctic is to engage with IEMA regarding IEMA comment 10 and reflect the outcomes of that discussion in Version 13.0 of the WROMP.***

Waste Rock Monitoring

The WROMP includes details on the management and monitoring of waste rock and ore. Section 4.4.5 of the 3-Year Seepage Report provided a monitoring update regarding schist and metasediment at the

Pigeon Development. During the public review, GNWT ECC (comment 9) commented that it agrees with Arctic's proposed approach going forward (i.e., 2023 onwards) to monitor Pigeon schist and metasediment as one unit (metasediment) that will continue to be managed as PAG material. Changes to the management and monitoring of waster rock and ore should be proposed through the WROMP. The Board confirmed that WROMP V.12.0, section 2.4.8 states that "the material mined from Pigeon pit is mixed metasediment, granite and diabase which will be managed as PAG material". This update thus appears to have been reflected in the WROMP and no comments about this were received during the public review of the WROMP V.12.0. As such, the Board is not requiring any additional revisions at this time with respect to this topic.

3.3.4 Field QAQC

GNWT-ECC (comment 4) commented on the results for the field duplicates and noted that the differences in the results suggest that "particle entrainment into some samples may have affected the results" GNWT-ECC noted that "Although environmental heterogeneity may result in the variations observed for the field duplicates, no recommendations were made by the proponent to resolve the issue. It is also unclear from the Report's information on whether this is a recurring issue" because there was no data provided for the 2020 and 2021 programs. GNWT-ECC recommended that to avoid particle entrainment in the sample and improve the quality of the duplicate (and test) samples, Arctic should consider collecting all samples using syringes rather than submerging a bottle in the seep, to avoid potentially disturbing underlying sediment". GNWT-ECC recommended that the sampling procedure be updated in the WROMP to attempt to resolve the issue and avoid particle entrainment. Arctic responded that it had recently submitted WROMP 12.0 for evaluation and that Appendix B, section 5.10 describes the sampling protocol.

Appendix B, section 5.10 of WROMP V.12.0 describes the sampling protocol as follows: "If the seep is deep enough, place each bottle in the water without disturbing the sediments and point the mouth of the bottle upstream. If the water is too shallow to sample without disturbing sediment, use a disposable plastic syringe to withdraw water from the seep and transfer to the bottles." GNWT-ECC did not raise this comment again in review of WROMP V.12.0, thus it is unclear if GNWT-ECC thinks this issue has been resolved. Also, as this public review took place concurrently, the GNWT-ECC may not have considered the need to repeat this recommendation there. According to the text quoted above, the protocol considers the use of syringes to avoid particle entrainment based on the depth of the sampling location. GNWT-ECC was recommending that syringes be used at all seeps given that entrainment appeared to occur despite this protocol. To ensure the protocol is updated if needed, the Board requires that V.13.0 of the WROMP address this recommendation. If no update is proposed, Arctic should provide rationale in its conformity table for why the current protocol is acceptable given GNWT-ECC's comment.

- ***WROMP Revision #2: Arctic is to address GNWT-ECC comment 4 in Version 13.0 of the WROMP.***

3.3.5 Verification Data Assessment

The WROMP includes details on the verification monitoring that is conducted on stored waste rock. GNWT-ECC (comment 8) commented that "The purpose of the verification program should be clearly

stated in the WROMP" and requested additional rationale to support the approach for assessing verification monitoring data. GWNT-ECC recommended that Arctic clearly state the objective of the verification program in the WROMP, including comparison (confirmation) with the predevelopment data, which would then be included in the 3-Year Seepage Report. Arctic acknowledged the comment and proposed that all concerns related to WROMP V.12.0 be addressed during the review session.

Section 7 of WROMP V.12.0 discusses verification, monitoring, and reporting; however, it does not clearly outline the objectives. No comments pertaining to the verification program were submitted during the public review of WROMP V.12.0; however, this public review took place concurrently, thus the GNWT-ECC may not have considered the need to repeat this recommendation there. To ensure that appropriate revisions are included if needed, the Board requires that V.13.0 of the WROMP address this recommendation. If no changes are being proposed, Arctic should provide rationale for why in its conformity table.

- ***WROMP Revision #3: Arctic to address GNWT-ECC comment 8 in Version 13.0 of the WROMP.***

3.3.6 Waste Rock Characterization - Modified Sobek Procedure

IEMA (comment 5) recommended that Arctic describe the difference that the use of the Modified Sobek procedure has on the NP and NP/MPA (Maximum Potential Acidity) neutralization potential ratio compared to use of the Standard Sobek procedure (i.e., whether the ABA analyses previously conducted using the Standard Sobek procedure can be directly compared to those conducted using the Modified Sobek procedure). Arctic responded by referencing Golder (2018) for a discussion regarding the difference between the geochemical classification criteria presented in DIAND (1992) and MEND (2009) but did not provide details regarding the comparison of results obtained by the Standard and Modified Sobek procedures. Arctic indicated that WROMP V.12.0 had recently been submitted to the Board, and that section 3.1.2 stipulates the methods of waste rock characterization.

The Board confirmed that section 3.1.2 of WROMP V.12.0 explains the past and current criteria for geochemical classification. The section states that "the Modified Sobek Method is used in the geochemical classification criteria calculation to define if waste rock is potentially acid generating at Ekati". Section 3.1.1 of the WROMP discusses both procedures, however, there is no discussion regarding the ability to compare the neutralization potential ratio yielded by the two methods. The Board is of the opinion that it is important to understand if the two methods yield results that allow for the comparison of past and current classifications, and requires that V.13.0 of the WROMP address this recommendation.

- ***WROMP Revision #4: Arctic is to address GNWT-ECC comment 5 in Version 13.0 of the WROMP.***

Signed the 31st day of January, on behalf of the Wek'èezhìı Land and Water Board

Mason Mantla
Chair, Wek'èezhìı Land and Water Board

Witness