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Staff Report

Applicant: Canadian Zinc Corporation	
Location: Prairie Creek, NT	**File Number(s):** MV2021L2-0004 and MV2021D0005
Date Prepared: August 16, 2021	**Date of Board Meeting:** August 26, 2021
Subject: Preliminary Screening Determination – Type A Licence Renewal and New Type A Permit Applications	

1. Purpose

The purpose of this Report is to present to the Mackenzie Valley Land and Water Board (MVLWB/the Board) a preliminary screening for Canadian Zinc Corporation's (CZN) Type A Water Licence MV2021L2-0004 (Licence) and Land Use Permit MV2021D0005 (Permit) Applications.

2. Background

Mining Authorizations

- September 18, 2008 – Applications for Permit MV2008D0014 and Water Licence MV2008L2-0002 referred to the Mackenzie Valley Environmental Impact Review Board (Review Board) for Environmental Assessment;
- June 17, 2013 – Issuance of Permit MV2008D0014;
- September 17, 2013 – Minister approves Licence MV2008L2-0002;
- September 24, 2013 – Issuance of Licence MV2008L2-0002;
- December 29, 2020 – Issuance of Permit MV2020D0007;
- February 16, 2021 – Issuance of Licence MV2020L2-0003;
- December 28, 2025 – Expiry of Permit MC2020D0007; and
- February 11, 2026 – Expiry of Licence MV2020L2-0003.

Mineral Exploration Authorizations

- May 7, 2001 – Review Board releases report EA00-002 for Phase 1 exploration;
- October 25, 2001 – Review Board releases report EA01-003 for Phase 2 exploration;
- September 7, 2003 – Issuance of Water Licence MV2001L2-0003 (previous Licence);
- December 22, 2005 – Review Board releases report EA0405-002 for Phase 3 exploration;

- February 3, 2006 – Minister approves report of EA0405-002 and later releases reasons for decision reconsidering the EA0405-002 at an unknown date;
- May 8, 2012 – Issuance of Land Use Permit MV2012C0008 (previous Permit);
- September 9, 2019 – Issuance of Water Licence MV2019L2-0006 and Permit MV2020C0008 (current mineral exploration authorizations);
- September 1, 2025 – Expiry of Permit MC2019C0008; and
- September 8, 2026 – Expiry of Licence MV2019L2-0006.

New Applications

- March 11, 2021 – New Licence MV2021L2-0004 Permit MV2021D0005 Applications received;
- March 19, 2021 – Applications deemed incomplete;
- May 27, 2021 – Revised Permit and Licence Applications received;
- June 4, 2021 – Applications deemed complete and review commenced;
- July 15, 2021 – Board invoked paragraph 22(2)(b) of the Mackenzie Valley Land Use Regulations for the Permit;
- July 15, 2021 – Comments and recommendations on the Applications due and received;
- July 29, 2021 – Extension request to proponent response deadline received;
- August 2, 2021 – Responses on Applications due and received; and
- August 26, 2021 – Preliminary Screening presented to the Board for decision.

3. Discussion

Project History

The Prairie Creek Mine dates to the 1960s. From 1966 to the mid-eighties, Cadillac Resources did significant exploration work at the site and developed mine infrastructure, shutting down prior to mining and operating the Mill. CZN has owned and operated the site since 1991. Since that time, the site has been in a state of care and maintenance and has held various Permits and Licences for Prairie Creek Mine. The activities authorized at Prairie Creek Mine include construction and maintenance of a temporary winter road followed by an All-Season Road that would connect the Liard Highway to Prairie Creek Mine (not yet constructed); mineral exploration (CZN is currently undertaking mineral exploration); and mining and milling (CZN has not yet started mining and milling).

History of Mining and Milling Authorizations

In 2008, CZN submitted applications for Type A Permit MV2008D0014 and Type A Water Licence MV2008L2-0002 for mining and milling. The 2008 applications were the subject of Environmental Assessment (EA) EA0809-002[1], which was approved by the Minister of the Government of the Northwest Territories – Department of Environment and Natural Resources (GNWT-ENR) on June 8, 2012. Permit MV2008D0014 was then issued for a term of five years, and was granted a two-year extension, expiring June 16, 2020. Licence MV2008L2-0002 was issued on September 24, 2013 for a term of seven years, expiring on September 23, 2020.

On May 13, 2020, CZN submitted renewal Applications for the Licence MV2008L2-0002 and Permit MV2008D0014 as the authorizations were due to expire on September 23, 2020 and June 16, 2020, respectively. As part of the applications, CZN indicated they had not entered into production due to challenging capital markets and sought to keep the mine licenced and permitted while they conducted an analysis to improve financial attractiveness. CZN indicated this would allow them to prepare for new and longer-term applications under an updated project description and mine plan. The renewed Permit (MV2020D0007) and Licence (MV2020L2-0003) were issued on December 29, 2020 and February 16, 2021, respectively. These were both issued for five-year terms.

History of Mineral Exploration Authorizations

Since the enactment of the *Mackenzie Valley Resource Management Act* (MVRMA) in 1999, CZN has held several authorizations for surface and underground mineral exploration. Multiple EA's have been conducted for surface and underground exploration activity: EA00-002, EA01-003, and EA0405-002.[2] [3] [4]

[1] See Review Board Online Registry (www.reviewboard.ca) for Report of Environmental Assessment and Reasons for Decision EA0809-002 Canadian Zinc Corporation Prairie Creek Mine.
[2] Review Board EA00-002 Report of Environmental Assessment on the Canadian Zinc Corporation Phase I Mineral Exploration Drilling Program, May 7, 2001
[3] Review Board EA01-003 Report of Environmental Assessment on the Canadian Zinc Corporation Phase II Mineral Exploration Drilling Program, October 25, 2001
[4] Review Board EA0405-002 Reasons for Decision and Report of Environmental Assessment on the Canadian Zinc Corporation Phase III Drilling Program, December 22, 2005

EA0405-002 was approved by the Minister of Indigenous and Northern Affairs Canada on February 3, 2006.[5] [6] Decline development was assessed under EA01-002. The Review Board released its report for EA01-002 on February 6, 2002 and a review of the final measures was later released at a later date.[7] [8]

Historically, CZN has held separate authorizations for surface and underground exploration. In 2020, they amalgamated both activities into one Water Licence (MV2019L2-0006) and one Land Use Permit (Permit, MV2020C0008); Licence MV2019L2-0006 was amended on September 2, 2020 to include surface exploration, and this was accompanied by the issuance of a new Permit MV2020C0008 that authorized both surface and underground exploration. The current authorizations enable the following:

- development of an additional underground decline;
- surface exploration at 60 sites via diamond drilling; and
- treatment of mine water emanating from the 870-m portal, which includes water from mine development conducted prior to CZN's acquisition of the Prairie Creek Mine, and water from the decline developed in 2006 and 2007.

In 2006 and 2007, CZN completed a development program that involved the rehabilitation of underground workings that were developed prior to CZN acquiring the Prairie Creek Mine, and the development of a new 600-meter-long decline tunnel from the existing 870-meter (m) portal (870-m above sea level). Following construction of the new decline, CZN also conducted underground mineral exploration by drilling within the decline. Most recently, CZN conducted surface exploration activities in the fall and winter of 2020.

Description of Applications

On March 11, 2021, CZN submitted Type A Licence (MV2021L2-0004) renewal and new Type A Permit (MV2021D0005) Applications to conduct surface and underground mineral exploration and mining and milling at the Prairie Creek Mine, NT (attached). The authorizations, if issued, would combine all mining and mineral exploration activities into one Licence and one Permit. CZN included an updated project description based on a project analysis they conducted. CZN's intent is to replace the existing mineral exploration and mining and milling authorizations.

The Consolidated Project Description describes an expanded project from what was contemplated as part of previous applications. The expanded project would increase the mine life from 14 to 15 years and result in increased mining and milling rates to account for increased capital and operating costs. Main access to the underground mine would remain at the 870-meter portal. The method of mining remains unchanged: ore (minerals containing metals) will be removed from underground and processed in the mill to separate metal concentrates (desired product) from waste products, such as waste rock

[5] Minister Accepting EA0405-002, dated February 3, 2006
[6] See the Review Board's Public Registry for EA0405-002
[7] Review Board EA01-002 Report of Environmental Assessment, Canadian Zinc Corporation, Underground Decline and Drilling and Metallurgical Pilot Plant Developments, February 6, 2002
[8] Review Board EA01-002 Reconsideration of Environmental Assessment Reasons for Decision

and tailings which is subsequently generated. Once processed, the metal concentrates will be transported to the Liard Highway via the All-Season Road, where it is then transported for further processing. As before, the mining process will require the management and treatment of water emanating from underground. Site infrastructure will include support facilities for construction, operations, and closure, as follows: waste rock piles, tailings storage, water storage ponds, water treatment, personnel camps, supplies storage, and fuel storage. Generally, the increased mining and milling rates proposed as part of the expanded project would increase the rate ore is extracted, increase the rate metal concentrates are produced, and increase the amount of waste and the rate in which waste products are produced.

CZN provided a table in their Consolidated Project Description that summarizes the project in 2013 terms and compares it to the expanded project currently envisioned and applied for as part of these applications. This information is reproduced in Table 1 below.

Table 1: Comparison of the existing authorizations against the expanded project being applied for in 2021[9]

Mining Activity	2013 Project (values are approximate)	2021 Expanded Project (values are approximate)
Main mine access	• 870 portal	• No change
Amount of ore processed	• ˜1,600 tonnes/day	• ˜ 2,400 tonnes/day
Mill	• Same footprint as at present	• No change
Concentrate Storage	• One very large shed	• No shed
Concentrate Transport	• Assumed up to 70 outbound trucks/day on the winter road • Concentrate storage shed needed for storage over summer/fall • Concentrate in bags	• Average ~18 outbound trucks per day on the all-season road • No need for concentrate storage shed • Concentrate in sealed containers
Supplies Storage	• Three warehouses	• Double size of existing cold storage shed
Waste Rock Pile	• 1.3 million tonnes (755,000 tonnes waste rock, 545,000 tonnes dense media separation rock) • Expansion had been expected in the future with a longer mine life	• ~5 million tonnes (2 million tonnes waste rock, 3 million tonnes dense media separation rock) • Will be in the same location as for 2013
Run-of-Mine Ore Stockpile	• 40,000 tonnes initially and 5,000 tonnes longer-term	• ~140,000 tonnes at peak storage requirement

[9] Canadian Zinc Corporation Consolidated Project Description, May 27, 2021 (p. 15)

Mining Activity	2013 Project (values are approximate)	2021 Expanded Project (values are approximate)
Tailings Stockpiles	• 10,000 tonnes in the Paste Backfill Plant • Up to 50,000 tonnes in the Water Storage Pond	• ~24,000 tonnes in the Paste Backfill Plant • ~190,000 tonnes secondary stockpile at peak storage requirement • Up to 50,000 tonnes in the Water Storage Pond as a contingency
Camp size (operations)	• 120 people onsite at any one time	• Up to 180 people onsite at any one time
Fuel	• Diesel	• Primarily natural gas (as liquid (LNG), or compressed (CNG))
Initial Mine life	• 14 years	• 15 years

The Applications were deemed incomplete on March 19, 2021. CZN submitted revised Applications on May 27, 2021, which were deemed complete and distributed for public review on June 4, 2021.

The Applications do not include the All-Season Road for which a separate Environmental Assessment was conducted (EA1415-01[10]), and is authorized separately; however, alterations from the expanded project are linked to the use of the All-Season Road. This is discussed further below.

Management Plans and other Documents Supporting the Applications

The following documents and management plans were included with the Applications (attached):

- Aquatic Effects Monitoring Program Design Plan
- Closure and Reclamation Plan
- Consolidated Project Description (including RECLAIM Closure Cost Estimate)
- Cover Letter and Engagement Log
- Engagement Plan
- Explosives Management Plan
- Effluent Quality Criteria Report
- Preliminary Screening Impacts and Mitigations Table
- Spill Contingency Plan
- Supporting Information (Final Prairie Creek Mine Dewatering Simulations, Effluent Model Spreadsheets, Water Storage Pond Feasibility Design)
- Tailings and Backfill Management Plan
- Waste Management Plan
- Waste Rock and Ore Storage Management Plan
- Water Management Plan

[10] See Review Board Online Registry (www.reviewboard.ca) for Report of Environmental Assessment and Reasons for Decision EA1415-01 Canadian Zinc Corporation Prairie Creek Mine.

Engagement

On October 9, 2020, the Board approved CZN's Engagement Plan on an interim basis upon issuance of the current Licence (MV2020L2-0003) and Permit (MV2020D0007). CZN included an Engagement Record and Engagement Plan with the new Applications (attached). CZN noted they engaged with the following Parties, which is consistent with previous submissions:

- Nahɔą Dehé Dene Band (NDDB)
- Łíídlıı Kúé First Nation (LKFN)
- Acho Dene Koe First Nation (ADKFN)
- Tthets'ehk'edeli First Nation (TFN)
- Sambaa k'e First Nation (SKFN)
- Fort Simpson Métis Nation (FSMN)
- Pehdzéh Kı́ first Nation (PKFN)
- Dehcho First Nations (DFN)

CZN has engaged with parties as part of regulatory proceedings. Specific to these Applications, CZN also engaged parties between November 6, 2020 and February 26, 2021 through the distribution of letters, , faxes and face to face meetings. Each party was contacted at least twice during this time period.

On November 6, 2020, CZN held a workshop by video conference to explain the expanded project. Representatives from NDDB, LKFN, and ADKFN attended the workshop, along with representatives from the GNWT – Department of Environment and Natural Resources (GNWT-ENR), the GNWT Department of Lands (GNWT-Lands), representatives from the Mackenzie Valley Review Board (Review Board), and Board staff. According to the Engagement Record, parties raised questions and provided comments of a technical nature. CZN indicated that they incorporated this information into the project description submitted with the Applications. TFN and SKFN expressed support for the Applications.

Type of Area

This project is in a non-federal area surrounded by the Nahanni National Park Reserve.

4. Preliminary Screening

As per the Preliminary Screening Requirement Regulations of the *Mackenzie Valley Resource Management Act* (MVRMA), the Board must conduct a preliminary screening for any application for a proposed development that requires a Water Licence and Land Use Permit if it is not exempt from Part 5 of the MVRMA. Under the Exemption List Regulations, CZN could be exempt from preliminary screening for portions of the project that have not been modified since the development fulfilled the requirements of the environmental assessment process established by the MVRMA.

Mining and Milling

Mining and milling were previously assessed under EA0809-002. The scope outlined in the report for EA0809-002 describes the elements of the proposed project that the Review Board considered. The scope of EA0809-002 is presented in Table 2 below.

Table 2: Final Scope of the Project as Defined by EA0809-002[11]

Phase	Components/Activities Included with 2008 Applications and Refinement of the Project during EA0809-002
Construction	Upgrade existing mine facilities including mill concentrator complex, powerhouse generators, maintenance workshops, administration building, accommodations, kitchen, sewage treatment plant, explosives magazine, fuel tanks, water storage pond and catchment pond
	Construction of new mine facilities including DMS plant, temporary DMS rock storage pad, paste backfill plant, concentrate bagging plant, concentrate storage shed, water treatment facility, exfiltration trench effluent outfall, sulphuric acid storage tanks, reagent storage sheds, cement batch plant, ore storage facility, waste rock pile, solid waste facility with incinerator and ancillary mine facilities
	Re-design and construction of existing water storage pond and catchment pond
	Create additional water storage capacity either by raising the dykes in the existing water storage pond or by building a second water storage pond
	Construction of underground facilities including a new 870 level portal with access ramp to lower mining levels, ventilation and exhaust fans, sumps and pumping stations, ore storage bin and underground maintenance shop
Operations	Underground mining and milling of ore including crushing dense media separation, grinding and floatation
	Production of lead concentrates and zinc concentrates, bagging and storage in concentrate shed until the winter haul season
	Operation of paste backfill plant, DMS plant and concrete batch plant for the production of tailings paste backfill and transport of paste underground for placement
	Operation of water treatment facility, sewage treatment plant, solid waste facility, water storage pond, catchment pond, waste rock pile and associated seepage collection pond
	Operation access roads, storage areas and other mine facilities required for the day to day workings of the mining project
	Management of hazardous and non-hazardous materials and wastes
Water management	Collection of contaminated water from underground, rock waste pile seepage pond, sewage treatment plant and ore stockpile for transfer to water storage pond
	Operation of existing water storage pond including recycling of mill process water
	Temporary storage of tailings in water storage pond
	Construction and operation of water treatment plant and discharge of treated water into Prairie Creek via an exfiltration trench

[11] See Review Board Online Registry (www.reviewboard.ca) for Report of Environmental Assessment and Reasons for Decision EA0809-002 Canadian Zinc Corporation Prairie Creek Mine (p.21-22)

Phase	Components/Activities Included with 2008 Applications and Refinement of the Project during EA0809-002
	Adopt one of two approaches to improving a proposed water treatment plant either by enhancing the sulphide-lime precipitation by adding filtration or by following the sulphide-lime pre-treatment with filtration and ion exchange
	Withdrawal of potable water from mine-site wells in the Prairie Creek aquifer
	Monitoring of water quality and quantity
Transport	Re-establishment of existing 180 km winter road from the mine site to the Liard Highway including construction of 3 route re-alignments that total approx. 63 km
	Construction and use of the Tetcela transfer facility for concentrate storage and handling at km 84.5 of the access route and a second transfer facility at the Liard Highway for the storage and handling of concentrate as well as incoming fuel and mine supplies
	Construction and operation of the annual winter access road during frozen ground conditions seasonally for 14 year mine life to haul concentrate from mine out to Liard Highway and haul fuel and other mine supplies from the Liard Highway to the mine site
	Upgrade and use of the existing 1,000 m length gravel airstrip located at the mine site for transport of people and supplies
	Construction and operation of gravel pits and borrow sites along the winter access road
	Water withdrawal from locations along the winter access road including the wells at the mine, Mosquito Lake, Gap Lake, and the Liard River
Closure and reclamation	Closure and reclamation of mine site components and winter access road

When assessing social and cultural impacts, the geographical scope of EA0809-002 included communities that traditionally used the area: Nahanni Butte, Fort Simpson, Fort Liard and Wrigley, the areas they use and vicinity of the proposed project in general. The temporal scope included the following phases of mine life:

- Construction of new mine facilities and road re-alignments (2 years).
- Mine operations (14 years).
- Closure activities (1 year).
- Post-closure monitoring (to be determined in Closure and Reclamation Plan).

Mineral Exploration

Surface and underground mineral exploration activities were previously assessed under EA00-002, EA01-003, and EA0405-002.[12] [13] [14] EA0405-002 was approved by the Minister of Indigenous and Northern Affairs Canada on February 3, 2006.[15] [16] Decline development was assessed under EA01-002. The Review Board released its report on February 6, 2002 and final measures.[17] [18] The current Licence (MV2019L2-0006) and Permit (MV2020C0008) that authorize surface and underground mineral exploration activities were deemed exempt from preliminary screening based on Part 1, Schedule 1, section 2,1 of the Exemption List Regulations to the MVRMA.[19] Activities include underground decline development accessed at the 870-metre portal, underground drilling, and surface drilling at up to 60 sites located throughout the Prairie Creek Mine property, the use of explosives, use of vehicles and machines, storage of fuel, and use of a campsite.

Canadian Zinc Corporation's Position Regarding Preliminary Screening

Mining and Milling

CZN included information pertaining to the impacts and mitigations of the expanded project in two documents: 1) a Consolidated Project Description; and 2) the Board's Preliminary Screening Impacts and Mitigations Table (both attached). CZN indicated that portions of the project were previously assessed as part of EA0809-002.

CZN also included a table summarizing areas that will be altered since EA0809-002, and new areas and activities that require preliminary screening as a result of the expanded project. CZN made their determination by identifying the status of project components as to whether they have been constructed, whether the components were previously assessed as part of EA0809-002, and, for instances where components were previously assessed, whether they will be altered as part of the expanded project. This information is provided in Table 3 below.

[12] Review Board EA00-002 Report of Environmental Assessment on the Canadian Zinc Corporation Phase I Mineral Exploration Drilling Program, May 7, 2001
[13] Review Board EA01-003 Report of Environmental Assessment on the Canadian Zinc Corporation Phase II Mineral Exploration Drilling Program, October 25, 2001
[14] Review Board EA0405-002 Reasons for Decision and Report of Environmental Assessment on the Canadian Zinc Corporation Phase III Drilling Program, December 22, 2005
[15] Minister Accepting EA0405-002, dated February 3, 2006
[16] See the Review Board's Public Registry for EA0405-002
[17] Review Board EA01-002 Report of Environmental Assessment, Canadian Zinc Corporation, Underground Decline and Drilling and Metallurgical Pilot Plant Developments, February 6, 2002
[18] Review Board EA01-002 Reconsideration of Environmental Assessment Reasons for Decision
[19] Licence MV2019L2-0006 (p 45)

Table 3: CZN's Assessment Regarding Areas and Activities that Require Preliminary Screening[20]

Yellow cells identify those that CZN indicate require screening

Component	Existing	Changes	Details and if Previously Screened	Screening Required
Airstrip Area				
Airstrip	Yes	No	Yes	No
Equipment and container laydown area	Yes	Yes	The area was screened for laydown and the excess material pile. It will now be used for laydown and container storage.	Yes, for the container storage
Quarry	Yes	No	No changes from previously intended use	No
Main Yard				
Water Storage Pond	Yes	No	There is an existing pond and the footprint will not change. The scope of remedial and construction works for conversion into the WSP haven't changed.	No
Flood protection berm	Yes	No	Yes	No
Living Quarters and personnel	Yes	Yes	Most of the existing bunkhouses will be removed and replaced with new quarters, which were screened. The new quarters will be 50% larger for additional personnel. Possible incremental increase in rotation flights	Yes, for increase in quarters and personnel
Well and pump house	Yes	Yes	The original potable quantity was screened, but the increased quantity was not	Yes, for potable quantity increase
Sewage treatment plant	Yes	Yes	An expansion was previously screened but the expansion will be larger	Yes, capacity increase
Kitchen	Yes	Yes	The old kitchen will be replaced with new. The replacement was screened and hasn't changed.	No
Incinerator	Yes	Yes	The existing incinerator will be replaced with a new model. This was screened but with a personnel increase the unit will operate more often	Yes, for the emissions increase
Administration building	Yes	No	Yes	No
Warehouses	Yes	Yes	Large warehouse construction was planned originally to store supplies between winter road access periods, but now are not needed because of all season road access	No
Machine Shops	Yes	No	Yes	No
Propane bullets	Yes	Yes	The bullets were screened but not for the current location	Yes, for new location
Decline waste rock pile	Yes	Yes	Yes, the small pile will form the base of the new stockpile or the rock will be moved to the permanent Waste Rock Pile.	No

[20] Ibid (p. 23)

Component	Existing	Changes	Details and if Previously Screened	Screening Required
Exploration water treatment plant	Yes	Yes	Yes. To be removed	No
Polishing Pond	Yes	Yes	Yes. To be removed	No
Coarse ore stockpile	Yes	Yes	Yes. To be removed	No
Run-of-mine ore stockpile	No	Yes	An initial 40,000 t pile was screened. The pile will now be 140,000 t	Yes, larger
Temporary waste rock stockpile	No	New	No. 3,000 t pile near portal	Yes
Paste backfill plant	No	Yes	The plant was screened but the location has been revised	Yes, for revised location
Active tailings stockpile	No	Yes	A 10,000 t pile was screened. The pile will now be 24,000 t	Yes, larger
Secondary tailings/ run of mine ore stockpile	No	New	No. Up to 180,000 t tailings pile and 77,000 t ore pile	Yes
Mill	Yes	Yes	Yes	No
Concentrate load-out	No	Yes	Yes. Smaller building now due to all season road access	No
Concentrate transfer	No	Yes	The original container/bag transfer plan was screened. The plan has changed to transport in sealed containers and the volume increased	Yes, increased volume
Dense media separation float stockpile	No	No	Yes	No
Power plant	Yes	Yes	The original gensets are being replaced with new, which were screened. No change to the plan	No
Diesel storage	Yes	Yes	Yes. Only 1of 4 tanks likely to be used	No
LNG/CNG storage /use	No	New	No	Yes
Water treatment plant	No	No	Yes	No
Catchment pond	Yes	Yes	Yes, the pond will be lined. No change to plan	No
Exfiltration trench	No	No	Yes	No
Backfilled mine	No	Yes	The original mine development plan was screened. The development extension requires screening	Yes, development extension
DMS Circuit[21]	Yes	No		

[21] The Consolidated Project Description indicates that the DMS circuit will be unchanged. Board staff understand this to be the DMS plant referred to in EA0809-002

Component	Existing	Changes	Details and if Previously Screened	Screening Required
Harrison Creek Area				
930/970 waste rock piles	Yes	No	Yes	No
Two bridges	Yes	No	Yes	No
Waste Rock Pile	No	Yes	A 1.3 Mt pile was screened. The pile will now be 5 Mt	Yes, larger
Bioremediation cell	No	Yes	The cells were proposed to be within the WRP footprint and were screened. The locations have been changed	Yes, revised locations
Sludge storage cell	No	Yes		
South Yard				
Excess material pile	No	Yes	Location changed from airstrip. The new location was previously screened for a 2nd WSP	Yes, revised location
Reagent Pad	Yes	No	Yes	No

Mineral Exploration

CZN indicated there are no changes to mineral exploration activities from what was previously contemplated, and that they are of the opinion that mineral exploration activities should be exempt from screening.

Board Staff Analysis of Preliminary Screening Requirements

Board staff conducted a comparative analysis to determine preliminary screening requirements for the Applications. This involved comparing the new Licence and Permit Applications against the scope of EA0809-002 and incorporating information pertaining to impacts and mitigations obtained during the public review of the Applications. In doing so, Board staff have summarized the areas and activities and temporal extent that were not included as part of EA0809-002 that subsequently require Preliminary Screening. Based on this analysis, Board staff have drafted a Preliminary Screening Reasons for Decision (attached), for the Board's consideration. The draft Preliminary Screening Reasons for Decision considers environmental and socio-economic concerns, along with proposed mitigations.

Information obtained from the public review is discussed further in the Public Review section below.

Mining and Milling New Areas and Activities

Table 4 below identifies areas and activities associated with the expanded project and summarizes Board staff's analysis as to whether preliminary screening is required.

Table 4: Summary of Preliminary Screening Requirements for Mining and Milling

Component	Screening Required?	Reason
Area Strip Area		
Airstrip	No	No change to what was contemplated as part of EA0809-002.
Equipment and container laydown area	Yes	The area was screened for laydown and the excess material pile. It will now be used for laydown and container storage.
Quarry	No	No change to what was contemplated as part of EA0809-002.
Main Yard Area		
Water Storage Pond	No	Despite re-design including division into two ponds, no screening required because the scope of the EA included re-design and construction of existing water storage pond and catchment pond.
Flood protection berm	No	No change to what was contemplated as part of EA0809-002.
Living quarters and personnel	Yes	Most of the existing bunkhouses will be removed and replaced with new buildings. The new quarters will be 50% larger to house additional personnel. Incremental increase in rotation flights. Increase in quarters and personnel from 120 people/day to 180 people/day during operations. Up to 300 people per day during peak construction.
Well and pump house	Yes	Increase amount of water withdrawn.
Sewage treatment plant	Yes	An expansion was previously screened but the expansion will be larger. Increase in personnel.
Kitchen	No	The old kitchen will be replaced with new. The replacement was screened and hasn't changed to what was contemplated as part of EA0809-002.

Component	Screening Required?	Reason
Incinerator	Yes	Incineration of dewatered sewage. New location.
Administration building	No	No change to what was contemplated as part of EA0809-002.
Warehouses	No	Large warehouse construction was planned originally to store supplies between winter road access periods, but now are not needed because of all season road access.
Machine Shops	No	No change to what was contemplated as part of EA0809-002.
Propane bullets	Yes	The propane bullets were screened but not for the revised location.
Decline waste rock pile	No	Use of decline waste rock pile to construct base of new temporary waste rock pile or deposition in main waste rock pile aligns with previous assessment.
Exploration water treatment plant	No	Removal planned.
Polishing Pond	No	Removal planned.
Coarse ore stockpile	No	Removal planned.
Run-of-mine ore stockpile	Yes	Increasing from 40,000 T to 140,000 T.
Temporary waste rock stockpile	Yes	New 3000 T pile near main site mine portal.
Paste backfill plant	Yes	The plant was screened but the location has been revised.
Active tailings stockpile	Yes	A 10,000 T pile was screened. The pile will now be 24,000 T.
Secondary tailings stockpile	Yes	New 190,000 T tailings pile.
Secondary run of mill ore stockpile	Yes	New 77,000 T ore pile.
Mill	No	No change to what was contemplated as part of EA0809-002.
Concentrate load-out	No	Smaller building as a result of All-Season Road.
Concentrate transfer	Yes	The original container/bag transfer plan was screened. Now will be done in sealed containers, and the volume increased.
Dense media separation float stockpile	No	No change to what was contemplated as part of EA0809-002.
Power plant	No	No change to what was contemplated as part of EA0809-002.
Diesel storage	No	Previously screened and reduced number of tanks will be used.
LNG/CNG storage and use	Yes	New fuel source.
Water treatment plant	No	No change to what was contemplated as part of EA0809-002.
Catchment pond	No	No change to what was contemplated as part of EA0809-002.
Exfiltration trench	No	No change to what was contemplated as part of EA0809-002.
Backfilled mine	Yes	The original mine development plan was screened. The development extension requires screening.
Various infrastructure: cement plant, acids shack, storage racks,	Yes	It was not clear from CZN's Application whether the infrastructure would be relocated or removed. Board staff assume the infrastructure is still necessary for operations, so have contemplated their relocation as part of

Component	Screening Required?	Reason
plumbing shop, parts warehouse, wooden cabins, carpentry shop, storage trailers, lumber yard, drill core storage, core shack, drill core, diamond drill staging area, pipe storage, assay lab, storage yard, steel parts yard are all removed in the new Consolidated Project Description		the analysis for preliminary screening. The infrastructure was assessed as part of EA0809-002, and it was determined that their impacts would likely be the same, but are unable to ascertain whether the magnitude would change, so recommend these components be screened.
Harrison Creek Area		
930 and 970 waste rock piles	No	No change to what was contemplated as part of EA0809-002.
Two bridges	No	No change to what was contemplated as part of EA0809-002.
Waste Rock Pile	Yes	Increasing from 1.3 Mt to 5 Mt. Changes to footprint and potential impact to heritage resources.
Bioremediation cell	Yes	The cell was proposed to be within the footprint of the Waste Rock Pile and was screened. The location has been changed.
Sludge storage cell	Yes	The cell was proposed to be within the footprint of the Waste Rock Pile and was screened. The location has been changed.
South Yard Area		
Excess Material Pile	Yes	Location changed from airstrip to South Yard. The new location was previously screened for a second Water Storage Pond.
Reagent Pad	No	No change to what was contemplated as part of EA0809-002.
Activities		
Mine operations	Yes	The expanded project described an increase in mining rate, depth of decline, and potential corresponding increases to the magnitude of impacts assessed under EA0809-002 to water, soil, air, aquatic life, and wildlife, particularly those that are near the mine site, such as Dall's sheep. Despite altering the fuel source from diesel to liquified or compressed natural gas, it is anticipated that carbon emissions associated with the project could increase due to increased incineration, and flight and vehicular traffic. It is anticipated that the increase usage of the incinerator will increase the generation of controlled substances, including complex organic compounds such as polycyclic aromatic hydrocarbons, dioxins, and furans.
Heavy equipment usage	Yes	Impact remains the same as was contemplated as part of EA0809-002; however, magnitude anticipated to increase.
Use and storage of explosives	Yes	No longer made on site but transported via the All-Season Road. Will now be stored underground as opposed to above ground.

Component	Screening Required?	Reason
Reagent use	Yes	Potential new products from what as previously contemplated.

Temporal Considerations

Temporal considerations for the analysis are as follows:

- Construction of new mine facilities and road re-alignments increasing from 2 years to 3 years (EA0809-002 was 2 years).
- Mine operations increasing from 14 years to 15 years (EA0809-002 was 14 years).
- Closure activities remained at 1 year (same as EA0809-002).
- Post-closure monitoring (to be determined in Closure and Reclamation Plan, same as EA0809-002).

Board staff are of the opinion that alterations to the temporal considerations of the expanded project do not significantly alter the impacts and mitigations from what was contemplated as part of EA0809-002.

Considerations for Wildlife

Impacts and mitigation measures, including regulatory instruments pertaining to wildlife, were considered in Board staff's analysis. This includes the Wildlife Management and Monitoring Plan required by the GNWT-ENR under the *Wildlife Act* and provisions under the *Species at Risk Act.*

Considerations for Air Quality

Impacts and mitigation measures, including regulatory instruments pertaining to air quality, were considered in Board staff's analysis. This includes the Air Quality and Emissions Monitoring and Management Plan required by ECCC.

Considerations for the All-Season Road

Some of the alterations associated with the expanded project are linked to the All-Season Road that will be used to transport materials to and from the mine site. This includes the hauling period, number of trucks, and the types of materials transported. Those impacts were not assessed as part of the preliminary screening for the current Applications. The All-Season Road is authorized under separate Licences and a Permit with various management plan submission requirements to address impacts identified as part of the EA for the All-Season Road (EA1415-01)[22]. The management plans required by the All-Season Road authorizations will require updates to align with the expanded project, and will require public review prior to consideration by the Board.

[22] See Review Board EA1415-01

Mineral Exploration

Board staff are of the opinion that the mineral exploration activities included in the new Applications do not warrant further preliminary screening since they have not been altered since the Board deemed them exempt.

5. Public Review of the Applications

The Applications were distributed for review on June 4, 2021. By July 15, 2021, comments and recommendations were received from the following Parties:

- ADKFN,
- Environment and Climate Change Canada (ECCC),
- Fisheries and Oceans Canada (DFO),
- GNWT-ENR,
- GNWT-Lands,
- GNWT-Inspector
- LKFN,
- NDDB,
- Parks Canada (PC), and
- Board staff.

GNWT-ENR and GNWT-Lands, including the Inspector for the Dehcho Region, made a joint submission. Comments from these parties are jointly referred to simply as the GNWT. In addition to LKFN submitting comments, Racher Consulting also submitted comments and recommendations on their behalf and that of the NDDB.

On July 29, 2021, CZN requested an extension to the response deadline from July 29 to August 2, 2021. Board staff granted the extension as it had no implications on the timeline in the work plan; CZN responded by August 2, 2021. The Review Summary and Attachments present the concerns identified through this review.[23] In this staff report, Board staff have summarized comments and recommendations specific to impacts and mitigations, and have incorporated this information as part of the preliminary screening assessment.

General

In their comments submitted by the July 15, 2021 review deadline, ADKFN, LKFN, and NDDB all indicated they do not feel an EA is necessary. Specifically, NDDB concluded that an EA would not provide much benefit to the project and both NDDB and LKFN indicated that the current understanding of potential impacts has improved since EA0809-002 was conducted.

[23] Review Summary and Attachments, August 2, 2021

PC indicated there is uncertainty in CZN's predictions regarding an overall reduction in environmental impacts, and that the increased rate in ore production and stockpiles [ore, tailings, waste rock] would substantially increase the risk of potential environmental impacts to the Nahanni National Park Reserve should CZN's predictions prove incorrect.

The GNWT indicated they agree with CZN's conclusions regarding preliminary screening requirements (GNWT 20), but noted additional activities and areas that CZN appeared to have omitted. Specifically, the GNWT noted (GNWT 21) the absence of various components, as follows: acids shack, storage racks, plumbing shop, parts warehouse, wooden cabins, carpentry shop, storage trailers, lumber yard, drill core storage, core shack, drill core, diamond drill staging area, pipe storage, assay lab, storage yard, steel parts yard are all removed in the revised mine plan. The GNWT indicated that removal is not an issue, but in the event any of the components are needed for the revised mine plan, it should be clearly identified where they will be relocated as there may not be suitable space. Board staff agree that this information should be provided by CZN; however, site infrastructure was assessed under EA0809-002, so this detail could be provided as part of the proceeding.

Additional discussion related to impacts and mitigations are organized by valued components (environmental, socio-economic, and heritage) and project components, as presented below.

Air Quality

CZN acknowledge impacts to air quality from the following sources and activities: power generation; incineration; dust generation from ore, waste, and tailings stockpiles; dust generation from transfer of tailings between stockpiles; and transportation of more metal concentrates. ECCC (ECCC 4) and PC (PC 12) noted the potential for a variety of impacts to air quality, and that CZN suggested these will be mitigated through the Air Quality and Emissions Monitoring Plan. This management plan is not required by the current authorizations, and was not included as part of CZN's Applications.

Dust (ECCC 4, MVLWB 19, PC 17, Racher 48)

Multiple reviewers noted that a general increase in site activity, the new tailings stockpiles, and CZN's plan to transfer tailings between stockpiles, would likely result in increased dust generation. ECCC noted that the generation of dust will increase, while mitigation measures were not identified (ECCC 4). ECCC recommended CZN identify mitigation measures to reduce the generation of dust and transportation of contaminants. In their reply, CZN stated that truck loading and unloading would be conducted in covered areas, they will have practices to prevent over-filling of trucks, and trucks would be covered with tarps while in operation.

PC indicated that monitoring of dust from traffic and other operations was not identified, and that it is not clear how monitoring will differentiate between dust from ore compared to other sources (e.g., dust generated from road traffic), and that potential impacts to water quality and vegetation is not understood (PC 17). Further, they note that the higher milling rate will increase the rate of other activities that generate dust (e.g., traffic, waste rock management). PC recommended that CZN describe the proposed monitoring program for dust from all sources and how impacts to water quality and

vegetation will be evaluated. Racher Consulting provided a similar comment with inclusion of concern for fish and wildlife. In their response, CZN referred to the development of the Air Quality and Emissions Monitoring and Management Plan and that the expanded project is not predicted to significantly increase dust and that dust control is a proposed mitigation at the mine and along the access road.

Board staff understand that CZN is utilizing the Air Quality and Emissions Monitoring Plan as the main mechanism for evaluating impacts to air quality and determining mitigation measures. Approval of this plan is outside the Board's jurisdiction, and as such, concerns expressed by parties regarding air quality will need to be addressed through the development of this plan outside of the Board's processes. Board staff note that impacts to water quality from dust during construction and operations could be addressed by the Water Management Plans and Aquatic Effects Monitoring Program, while impacts to soil and vegetation could be addressed by other Licence and/or Permit conditions as developed through the current regulatory proceeding.

Surface Water

ECCC noted that the Effluent Quality Criteria Report predicts that phosphorous concentrations will be elevated (ECCC 12). In CZN response, they indicated that sewage is likely the main source of phosphorus, and that they plan to deposit sewage into Cell A of the Water Treatment Plan (in the Application CZN indicates this will be treated effluent), which would then be utilized in the milling process and recycling back to the pond. In a separate response (GNWT 6), CZN indicated their position that they feel the development will have a positive effect in terms of water quality since prior to CZN beginning treatment of mine water in 2006, water has historically emanated from the mine portal without treatment. CZN's position seems to be that closure of site components (sealing of underground openings, and treatment) will improve water quality as compared to current conditions.

Board staff note that CZN's plan to deposit sewage into Cell A of the Water Storage Pond is preliminary and that numerous comments and recommendations pertaining to water management were provided by reviewers (e.g., MVLWB comments 64 – 111). The impact of phosphorous and other potential contaminants on the receiving environment can be addressed as part of this proceeding through the development of Effluent Quality Criteria (EQC) that align with the Board's *Water and Effluent Quality Management Policy*. This can also be addressed through the development of an Aquatic Effects Monitoring Program.

Regarding the Sewage Treatment Plant, the GNWT indicated they were uncertain if CZN's preference to incinerate sewage solids or add to the paste mix for underground backfill was previously screened (GNWT 19). CZN did not provide a mitigation measure as part of their response. Board staff included this as part of preliminary screening.

Regarding post-closure water treatment, PC requested clarification that 4-8 years of post-closure treatment will be adequate. CZN are uncertain as to the length of time treatment will be required. They stated the timeline will be re-assessed during operations using monitoring data. Board staff note that this would be determined through the development of the Closure and Reclamation Plan.

Erosion and Sedimentation

The GNWT noted that CZN identified a new truck pullout near the airstrip that was not discussed in preliminary screening (GNWT 19). CZN did not provide a mitigation measure as part of their response. Board staff suggest that the impacts of constructing this area could be mitigated by through Standard Conditions requiring Design and Construction Plans and Structure Description and Construction Plans.

In the same comment, the GNWT expressed the following:

1) That the proximity of the new incinerator's location to the new propane storage area should be considered as part of screening.
2) That additional equipment will be required and it is unclear if additional mine equipment would require screening.
3) That the use of new reagents presumably will require screening.

CZN did not provide a mitigation measure as part of their response. Board staff have included this in the preliminary screening.

Vegetation Loss

Board staff noted that CZN concluded that vegetation loss from the Waste Rock Pile expansion would be inconsequential (MVLWB 17), and requested CZN provide supporting rationale. Racher Consulting provided a similar comment (Racher 44). CZN partially addressed the recommendations by indicating the area is 42 ha larger than the Waste Rock Pile that was original proposed, and that the area is sloped, rocky, and previously disturbed by exploration access roads. Board staff also requested supporting rationale for conclusions CZN made regarding the area being poor habitat. CZN stated that observations from mine staff over three decades suggests that limited wildlife has been observed in the area where the Waste Rock Pile expansion will be constructed.

PC provided a comment related to monitoring vegetation (PC 12). CZN did not specifically address vegetation monitoring in their response. There are some commitments from EA0809-002 with respect to establishing vegetation along riparian banks, and revegetation upon closure; however, there is no requirement for vegetation monitoring during operations. Board staff note that post-closure monitoring could include vegetation monitoring, which would be determined as part of developing the Closure and Reclamation Plan.

Soil

Board staff requested CZN clarify measures to prevent soil from becoming contaminated. CZN referred to the procedures contained within the Spill Contingency Plan (MVLWB 18).

Aquatic Life

ADKFN stated CZN did not discuss management practices for blasting activities as part of the Applications. ADKFN identified the potential for erosion and sedimentation from reduced bank stability and how blasting residues could impact fish, fish eggs, and fish larvae (ADKFN 23). ADKFN recommended

CZN update the Explosives Management Plan to include adherence to the Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters[24], management practices contained therein, and standard industry practices, such as:

1) Adhere to 50 kPa overpressure threshold.
2) Calculate the required setback distance from both general and spawning habitat types based on the anticipated charge weights.
3) Refrain from the use of confined or unconfined explosives near fish habitat.
4) Take precautions to prevent the discharge of potentially toxic by-products such as ammonia, at concentrations which create a risk to aquatic life.

Of note, DFO provided a similar recommendation (DFO 3). In their responses, CZN indicated that seepage from the Waste Rock Pile will be managed as contact water (which will be recycled), blasting residues will be limited by the use of emulsion explosives, and the Surveillance Network Program (SNP) will include potential contaminants from blasting activities. CZN also committed to adhering to the Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters.

Terrestrial Wildlife

ECCC noted potential impacts to terrestrial wildlife will be mitigated through a Wildlife Management and Monitoring Plan, which was not submitted with the Application. As a result, ECCC conveyed that they were not able meaningfully assess proposed mitigation measures, and that a number of updates and additions may be required (ECCC 2). PC and Racher Consulting provided comments related to monitoring wildlife (PC 12 and Racher 43). In CZN's response, they committed to updating the Wildlife Management and Monitoring Plan and resubmitting to applicable regulators.

Birds

GNWT commented that it is not clear whether development of the Waste Rock Pile will require vegetation clearing, or the timing of such clearing, should it be necessary (GNWT 27). The GNWT noted this could pose potential impacts to active bird nests and inactive raptor nests, while the last iteration of the Wildlife Management and Monitoring Plan (dated February 23, 2011) does not include survey methods or means to avoid nesting season. They recommended the Permit include specific conditions to protect nesting areas. These recommendations are not discussed further here, but will be assessed as part of the proceeding. The GNWT also provided the following recommendations to CZN:

1) Conduct vegetation clearing and any new ground disturbance outside of the nesting season for birds in the project area.
2) If disturbance or destruction of an occupied nest or eggs of a non-migratory bird species (including raptors), or an unoccupied raptor nest, cannot be avoided and all other all mitigation options have been ruled out, Proponents should contact the regional GNWT-ENR office to determine whether a permit to disturb or destroy the nest/eggs can be obtained.

[24] Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters (DFO, 1998)

3) They also recommended CZN adhere to various guidance material, including:
   a. Information pertaining to critical breeding periods for raptors in the Northwest Territories.[25]
   b. Government of Canada's Guidelines to reduce risk to migratory birds.[26]
   c. Government of Canada's General nesting periods of migratory birds.[27]
   d. If active nests are encountered during project activities, implement protective buffer zones described in the applicable regional Land Use Plan, Table 2-5 of the Northern Land Use Guidelines – Northwest Territories Seismic Operations[28] or the Government of Canada's guidance on Establishing buffer zones and setback distances for nests.[29]

CZN committed to addressing the recommendations.

Bears and Bats

The GNWT noted the impacts and mitigations table submitted by CZN identified impacts to grizzly bear dens and bat roosts (GNWT 28). They recommended the Permit include specific conditions to protect dens and roosts. These recommendations are not discussed further here, but will be assessed as part of the proceeding. The GNWT also provided the following recommendations to CZN:

1) Contact GNWT-ENR prior to start-up of project activities to determine if there are any known dens, push-ups, lodges, beaver dams or hibernacula, or bat maternity roosts within the project area.
2) Conduct pre-activity surveys within 800m of the Waste Rock Pile or any other areas experiencing new vegetation clearing or ground disturbance to identify active bear dens between September 30 and March 30. Surveys should be conducted in the fall shortly after the first snow fall to detect freshly dug dens.
3) If an active bear den is detected, or suspected, implement and maintain an 800 m buffer zone until the bear emerges in spring.
4) If the bear den and exclusion zone would result in the halt of part or the entire program, contact GNWT-ENR to discuss alternative mitigation options. The location of active bear dens should be kept confidential between the developer and GNWT-ENR until after emergence in the spring.
5) The Proponent should avoid vegetation clearing or demolition of buildings or other man-made structures that may be used as summer maternity roosts for bats between May 1 to September 30.
6) Check whether there are setback distances and timing restrictions for wildlife abodes within the applicable regional land use plan.

[25] Critical Breeding Periods for Raptor Species of the Northwest Territories (Shank and Poole, 2013)
[26] Government of Canada's Guidelines to reduce risk to migratory birds
[27] Government of Canada's General nesting periods of migratory birds
[28] GNWT Department of Lands Northern Land Use Guidelines, Northwest Territories Seismic Operations (2015)
[29] Government of Canada's Guidelines to reduce risk to migratory birds, buffer zones and setback distances

7) They also recommended CZN adhere to various guidance material, including:
   a. NWT Guide for Managing Bats in Buildings.[30]
   b. Table 2-5 of the Northern Land Use Guidelines: Northwest Territories Seismic Operations for guidance on setback distances and timing windows for wildlife abodes.[31]

CZN responded by stating recommendation 5) is impractical; summer is when the main activities occur and they have not observed any evidence of bats on the mine site but would inspect for nests and bats, and they will avoid clearing and demolition to the extent possible, if any are found. CZN committed to the remaining recommendations.

PC conveyed the importance of managing wildlife attracts and indicated the site is in an important area for grizzly bears. They recommended the Wildlife Management and Monitoring Plan include reducing wildlife attractants, reducing the likelihood of human-wildlife conflict, specifications pertaining to fencing around waste storage areas, and that all site personnel should be trained in bear awareness. CZN committed to PC's recommendations.

Caribou and Bats

In another comment, the GNWT indicated the project overlaps with the habitat of NWT-listed or pre-listed species, as follows: Northern Mountain Caribou (Special Concern in the NWT), Little Brown Myotis (bat) (Special Concern in the NWT), and Northern Myotis (bat) (Special Concern in the NWT). The GNWT identified potential impacts to these species, but concluded that ENR is satisfied that, with adherence to the recommendations contained within GNWT's submissions, potential impacts to the species at risk listed above can be avoided or minimized. The GNWT noted that Little Brown Myotis and Northern Myotis were not assessed or listed at the time the Wildlife Management and Monitoring Plan was last updated. The GNWT recommended CZN update their Wildlife Management and Monitoring Plan with the following (GNWT 30): recently assessed/listed species at risk that may overlap with the project area; detail on pre-vegetation clearing or pre-disturbance surveys that will take place to determine the potential presence of summer maternity roosts of Little Brown Myotis and Northern Myotis; and mitigation measures that will be followed in the event that they are detected. CZN committed to these recommendations.

LKFN noted that a recent study concluded that boreal woodland caribou use habitat within 4 km of the mine site. LKFN requested CZN provide an update on research pertaining to boreal caribou in the region, along with potential impacts and proposed mitigation measures (LKFN 2). CZN responded by conveying that impacts to wildlife (including caribou) were assessed in the EA0809-002. Since then, additional caribou studies have been conducted: A document titled Prairie Creek Mine All-Season Road Caribou Data Gap Analysis (dated November 2019) summarizes the more recent caribou surveys in the region, including CZN's aerial caribou survey (March 2019), and Parks Canada's satellite collared caribou data. CZN stated they are also preparing an additional report that presents the results of the remote cameras

[30] GNWT Guide for Managing Bats in Buildings
[31] GNWT Department of Lands Northern Land Use Guidelines, Northwest Territories Seismic Operations (2015)

(June 2019 - August 2020) installed at the mine, airstrip, and portions of the proposed All-Season Road. CZN committed to including results from these surveys into the Wildlife Management and Monitoring Plan.

Racher Consulting (Racher 49) asked whether CZN factored forthcoming regulatory changes in wildlife decision-making and protection, specifically related to monitoring and mitigations. Racher Consulting referred to northern mountain caribou being listed species at some point in the future, and the forthcoming Southern NWT Region Boreal Caribou Range Plan, combined with the proposed mine operations/footprint changes. In their response, CZN stated that the Species Status Report for northern mountain caribou (Species at Risk Committee 2020) indicates that the mine is located outside mountain caribou range, outside of known Boreal caribou range, outside designated important wildlife areas for mountain caribou, and in an area of vagrant mountain caribou occurrence. They also stated that previous baseline studies at and near the mine site, as well as more recent aerial survey and a remote camera study, support this conclusion. As a result, CZN indicated any listing changes will not change the already planned mitigation and monitoring.

Mountain Goats and Dall's Sheep

PC stated the mine site is near an important wildlife area for mountain goats and Dall's sheep, both having been regularly observed near the site. PC noted that areal disturbance is known to be one of the biggest disturbances to mountain goats and sheep. PC recommended CZN provide information on the anticipated average number of flights per week and the types of planes used, and that the Wildlife Management and Monitoring Plan be updated to include a Flight Impact Mitigation Plan to reduce the impacts of the additional flights and louder engines on wildlife (PC 13). In their response, CZN indicated that mapping conducted by Wilson and Haas (2012)[32] identified a mountain goat area along Prairie Creek near the Nahanni National Park Reserve border, but not near the mine site or airstrip. Further, CZN stated the Dehcho Atlas identifies mountain goat range west of the Mine near the headwaters of the South Nahanni and Clearwater rivers. CZN then stated that mountain goats have also not been observed during any Prairie Creek Mine and access road surveys (1981, 1994, 2006 to 2007, 2009 to 2010, 2014, 2016-2017, or 2019) or observed on remote cameras installed at and near the mine site (June 2019-August 2020). CZN acknowledged that Dall's sheep are present and committed to updating the Wildlife Management and Monitoring Plan with inclusion of a Flight Impact Mitigation Plan to describe the aircraft type and anticipated average number of flights per week.

Racher Consulting (Racher 46) also noted that increased noise and human presence were not discussed for wildlife beyond Dall's sheep. CZN noted that sources of sensory disturbances, including noise, was included in EA0809-002 from various site activities. Sensory disturbances from the original Mine plan were predicted to be of a high magnitude, low geographic extent, and variable frequency (ranging from low to high). The Mine expansion project is predicted to slightly increase the level of these sensory

[32] Wilson, J.M and C.A. Haas. 2012. Important Wildlife Areas in the Western Northwest Territories. Environment and Natural Resources, Government of Northwest Territories, Yellowknife, NT.

disturbances but not the overall effects on wildlife since the effects remain localized and the frequency wildlife occur in the local area is predicted to stay the same.

Moose

Racher Consulting noted that there is moose habitat that crosses the mine site and CZN did not discuss the impacts posed by the expanded project (Racher 45). In CZN's response they indicate EA0809-002 noted moose occasionally occur in the Prairie Creek valley but that the Mine site is located outside preferred moose habitat. The assessment predicted that the Mine would have an overall low effect on moose.

With respect to the recommendations that reviewers provided pertaining to wildlife, CZN committed to addressing these through updates to the Wildlife Management and Monitoring Plan. Board staff note that wildlife management and monitoring plans are required under section 95 of the *Wildlife Act*.

Infrastructure Related

Mill (MVLWB 16)

Board staff requested rationale as to why changes to the mill do not warrant screening. CZN indicated that the majority of changes were previously contemplated, and those that weren't related to alterations within the building, including electrical controls, mechanical units, etc.

All Season Road

Multiple reviewers provided comments pertaining to the All-Season Road. ECCC stated they were not able to provide comments specific to impacts and mitigations associated with the All-Season Road since the Applications did not include context related to the road. Board staff expressed uncertainty whether the changes to the mine (MVLWB 13), namely production rates and the rate in which waste is generated, would result in alterations to the All-Season Road that were not contemplated as part of the All-Season Road's Environmental Assessment (EA1415-01). PC submitted a similar comment and recommended CZN compare anticipated road usage to that assumed under the expanded project, and a summary of activities that will change (PC 2). Racher Consulting requested information pertaining to potential impacts to wildlife (Racher 47).

In CZN's response, they indicated they intend to submit Type A Water License Applications for the All-Season Road, and that the impacts and mitigations could also be reviewed during that process. They also provided two documents with information pertaining to truck transport rates and impacts to wildlife. The documents concluded the following:

- The types of trucks that will be used are heavier. Transport will be conducted with trucks that have two 20 tonne container loads.
- A 30% increase in days per year that hauling will occur. Hauling will now also occur late April, throughout May and June, and into November, whereas hauling was previously planned for January to March and July to October.
- Similar rate of truckloads per day (1.2 to 21.4 loads per day as opposed to previously estimated rate of 7.4 to 19.8 loads per day. EA0809-002 assumed 70 loads per day in winter).

CZN indicated their position that the changes do not alter the effects predicted under EA1415-01 or the mitigations proposed. Monitoring programs that CZN have presented for traffic, animal-vehicle collision, harvesting, and others will suitably address the expanded project's increased haul periods. Daily traffic volumes will not significantly change the wildlife effects assessment; based on modelling using the Seiler model (2003), wildlife are predicted to successfully cross the All-Season Road at the expanded project's increased haul rate and haul period, none would be killed, and none would be repelled by traffic and traffic noise. Mitigation and monitoring associated with the road traffic has been presented in the Wildlife Management and Monitoring Plan [for the All-Season Road] and will be incorporated as part of other updates. Regarding local harvesting, CZN indicated this was assessed during EA1415-01 and the mitigations and monitoring programs continue to be appropriate.

With respect to altering the main fuel source on site from liquid diesel fuel to natural gas (either liquid or compressed), Board staff requested CZN discuss if new mitigations would be required (MVLWB 14). CZN indicated that natural gas poses less risk of spills, that management plans for the All-Season Road are suitable, so no additional mitigation measures are necessary.

PC requested CZN clarify whether the All-Season Road would be required to access the site for post-closure monitoring (PC 11). CZN indicated they are not certain.

Archaeological / Heritage Resources

Board staff (MVLWB 21) and Racher Consulting (Racher 50) requested CZN provide more information to support their conclusion that the area where Waste Rock Pile will be expanded is considered to have low heritage resource potential. CZN responded by indicating heritage resources are normally associated with trails and camp sites, whereas the Waste Rock Pile area is not conducive to either. Also, the area has been used for exploration access roads and a recent Archaeological Overview Assessment (July 2021) determined that the expansion area has low archaeological potential.

Racher Consulting (Racher 51) requested CZN clarify whether a muskeg area was previously assessed archaeologically and provide results. CZN indicated that the muskeg area intended for the Excess Material Pile is adjacent to the Reagent Storage Pad and that this area was extensively disturbed during previous site activities. CZN did not provide an indication if it was previously assessed.

The Prince of Wales Northern Heritage Centre did not provide comments or recommendations.

Cumulative Effects

The GNWT indicated that CZN stated that the project will not result in cumulative effects. (GNWT 6). In CZN's response, they indicated they are not proposing to significantly change the footprint of the disturbed area since EA0809-002 was conducted.

Climate Change

ECCC indicated it is not clear if CZN considered and incorporated climate change into post-closure planning and recommended CZN provide this information (ECCC 3). CZN did not specifically address the recommendation; though, they did provide a technical memorandum that concluded 100-year precipitation amounts may increase by 20.5%. CZN indicated their position that consideration for climate change could be addressed during detailed design. Board staff agree that further consideration related to climate change will be addressed during detailed design. This should include the various life cycles of the mine from construction, operations, closure, and post closure, including potential care and maintenance periods.

6. Security

Part C, Condition 1 and Schedule 2 of CZN's existing Licence for mine operations (MV2020L2-0003) requires a security deposit totaling $13,530,000.00 over phased installments based on the effective date of the Licence, at intervals prior to the extraction of waste rock, and prior to commencing milling. Condition 31 of CZN's existing Permit for mine operations (MV2020D0007) requires a security deposit of $250,000.00.

Part C, Condition 1, and Schedule B of CZN's existing Licence for mineral exploration (MV2019L2-0006) requires a security deposit totaling $210,648.00. Permit, Condition 57 of CZN's existing Permit for mineral exploration (MV2020C0008) requires a security deposit totaling $311,338.00.

CZN submitted an updated closure cost estimate with these new Applications (attached). Security will be reassessed during this proceeding.

7. Conclusions

Mineral Exploration

Based on the information provided in the Applications and the public review, Board staff are of the opinion that the proposed underground exploration, surface exploration, and decline development activities would result in the same impacts, and of the same magnitude, as contemplated in previous EAs (EA00-002, EA01-003, EA0405-002, and EA01-002), and, therefore, do not warrant further screening.

Mining and Milling

Based on the information provided in the Applications and the public review, Board staff are of the opinion that the proposed mining and milling activities under the expanded project would result in similar impacts, if not the same impacts, that were contemplated in EA0809-002. However, the magnitude of the impacts that were contemplated in EA0809-002 may increase for various Mine project areas and activities, and, therefore, warrant further screening. Board staff; however, are of the opinion that the expanded project will not have a significant adverse impact on the environment or be a cause of public concern.

Board staff conclude there are no outstanding issues or concerns with this Preliminary Screening Determination.

8. Recommendation

Board staff recommend the Board:

a) **Confirm previously screened activities** for Canadian Zinc Corporation's Applications for Water Licence MV2021L2-0004 and Land Use Permit MV2021D0005 **are exempt from preliminary screening as per the Exemption List Regulations**; and

b) **Make a motion to approve the Preliminary Screening and Reasons for Decision (pending final review by the Chair)** for new Project Activities associated with Canadian Zinc Corporation's Applications for Water Licence MV2021L2-0004 and Land Use Permit MV2021D0005.

A draft notification letter is attached.

9. Attachments

- Permit Application
- Licence Application
- Project Description (including RECLAIM Closure Cost Estimate)
- Cover Letter and Engagement Log
- Engagement Plan
- Spill Contingency Plan
- Waste Management Plan
- Tailings and Backfill Management Plan
- Waste Rock and Ore Storage Management Plan
- Explosives Management Plan
- Contaminant Loading Management Plan
- Aquatic Effects Monitoring Program Design Plan
- Water Management Plan
- Closure and Reclamation Plan
- Closure Cost Estimate
- Preliminary Screening Impacts and Mitigations Table
- Site Figure
- Water Storage Pond Feasibility Design (2012)
- Effluent Quality Criteria Report
- Supporting Information:
  - Final Prairie Creek Mine Dewatering Simulations
  - Effluent Model Spreadsheet (except As and Zn increased effluent)
  - Effluent Model Spreadsheet (including As and Zn increased effluent)
  - 2012 Water Storage Pond Feasibility Design
  - 2010 Water Storage Pond Preliminary Design Report

    - 2014 Water Storage Pond Feasibility Design
- Incomplete Letter
- Response to Incomplete Letter
- Draft Preliminary Screening Reasons for Decision
    - Draft Letter to Review Board re 10-day pause period

Respectfully submitted,

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